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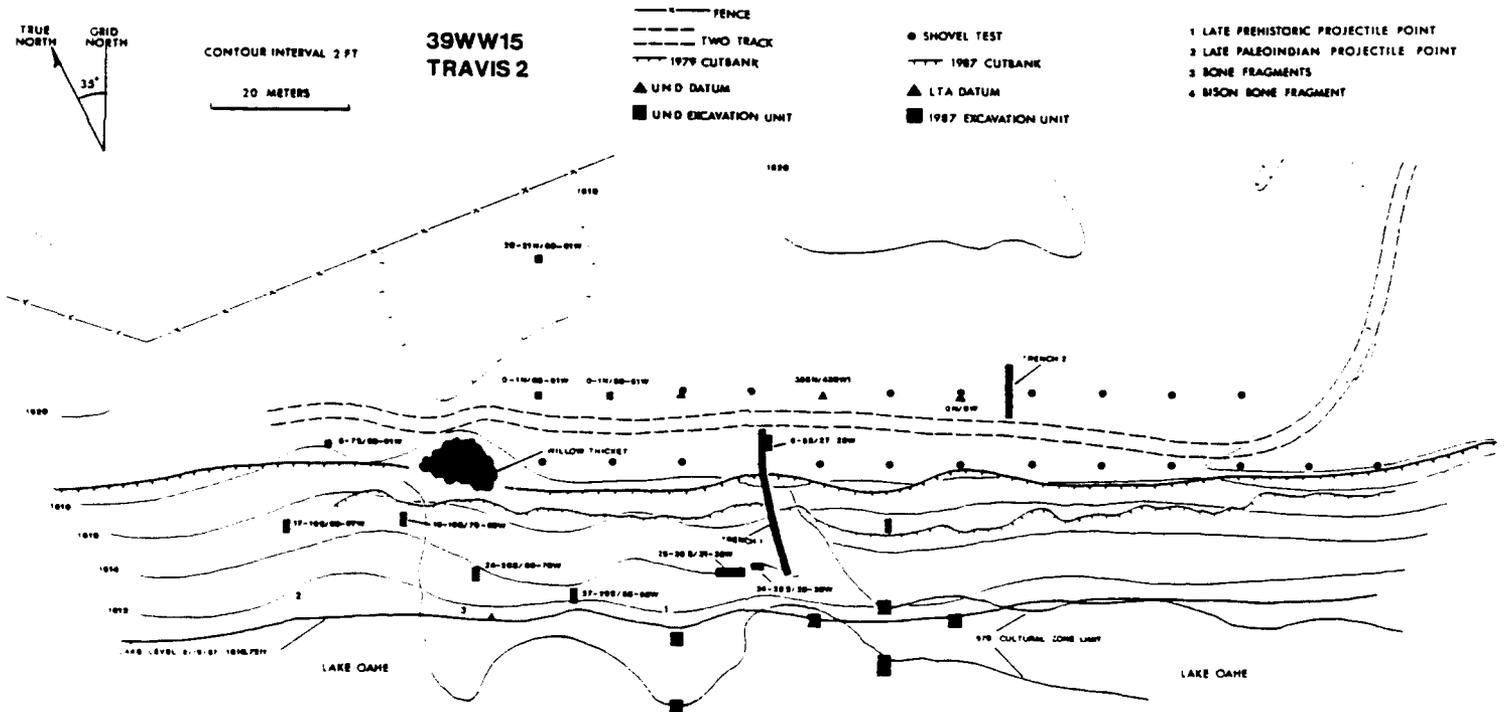


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Results of the 1987 Archeological Investigations at the Travis 2 Site, 39WW15, Walworth County, South Dakota

Prepared By:
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Laramie, Wyoming

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RESULTS OF THE 1987 ARCHEOLOGICAL INVESTIGATIONS
AT THE TRAVIS 2 SITE, 39WW15, WALWORTH COUNTY, SOUTH DAKOTA

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ABSTRACT

In 1987, Larson-Tibesar Associates conducted archeological investigations at the Travis 2 site (39WW15) located southeast of Mobridge, South Dakota on the shore of Lake Oahe. The Travis 2 site is a multiple component, temporary campsite most noted for its Late Paleoindian component. The purpose of the investigations was to determine the present site extent and integrity. Twelve excavation units, 22 shovel tests and 2 backhoe trenches were excavated. These yielded only small amounts of cultural material. A concentration of artifacts from the 30 to 40 cm level of Excavation Unit 25 m S/31-35 m W is believed related to the Late Paleoindian component. An area northwest of the excavation unit encompassing approximately 650 square meters has the best potential for containing buried cultural materials. This area is recommended for further data recovery before erosional impacts destroy the remainder of the site.

ACKNOWLEDGEMENTS

Funding for the 1987 Travis 2 site investigations was provided by the Department of the Army, Corps of Engineers, Omaha District (Purchase Order DACW4587P1037). The authors also wish to acknowledge the assistance of a number of individuals and organizations for their help during the project. Mr. Marion Travis visited with the field crews and was contacted several times by telephone throughout the course of the project. His interest and knowledge has been of great benefit, not only to our investigations, but for all work that has been conducted at the site. Dr. Stanley Ahler made the University of North Dakota's reports and field records available to our staff. Without this information, it would have been nearly impossible to correlate our results with those from the previous investigations. The metal detector used in the relocation of site datum points was loaned at no charge by the Wyoming Recreation Commission, Office of the State Archaeologist. Ms. Pat Hofer with the South Dakota Archaeological Research Center provided copies of the site forms, National Register forms, and other written documentation on the Travis 2 site. Finally, we would like to thank Mr. Mike Key and the rest of the staff at the Mobridge Corps of Engineers Office for providing various types of assistance during our stay in Mobridge.

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CHAPTER ONE INTRODUCTION

Thomas K. Larson

This report presents the results of archeological investigations undertaken during the summer of 1987 by Larson-Tibesar Associates under Contract Number DACW4587P1037 issued by the U.S. Army Corps of Engineers, Omaha District. The archeological investigations conducted are intended "to meet the Omaha District's obligations to Federal preservation legislation and associated implementing regulations" (Corps of Engineers 1986:1).

The focus of the Larson-Tibesar investigations was the Travis 2* site, 39WW15, located on Corps of Engineers administered land approximately one km southeast of the community of Mobridge in Walworth County, South Dakota (Figure 1.1). The work included an exhaustive literature search, site mapping, surface collections, hand dug and mechanical test excavations, and analysis and interpretation of results. These studies were specifically intended to determine the integrity of the Travis 2 site and to supplement what is presently known about the site. In addition to the present report, Contract Number DACW4587P1037 also calls for the preparation of a professional quality, journal length article and the development of a public education program.

All artifactual materials recovered as a result of the Larson-Tibesar investigations will be stored at the South Dakota Archaeological Research Center in Rapid City. Original notes, field forms and photographs are on file at the Omaha District, Corps of Engineers, 215 North 17th Street, Omaha, Nebraska, 68102-4978.

The remainder of this report contains another seven chapters as well as references cited and three appendices. The report is organized in the manner specified by the Corps of Engineers in the original scope of work for the project (Corps of Engineers 1986:4-5). The scope of work also specified the information categories to be included in each section or chapter. As originally specified in the scope of work, certain of the contents called for in the Results section (Corps of Engineers 1986:5) seem to be duplicates of information called for in other parts of the report. Because of this, Larson-Tibesar Associates proposed a modification

* note: The site under discussion has been referred to in the past variously as "Travis 2," "Travis II," and "Travis #2." National Register forms for the site (Wood 1977) and published lists of National Register eligible properties (e.g., Federal Register 1979:7647) list the common name of the site as "Travis II." For sake of consistency with previously produced major reports on the site, the present authors have chosen to refer to the site by its original name of "Travis 2."

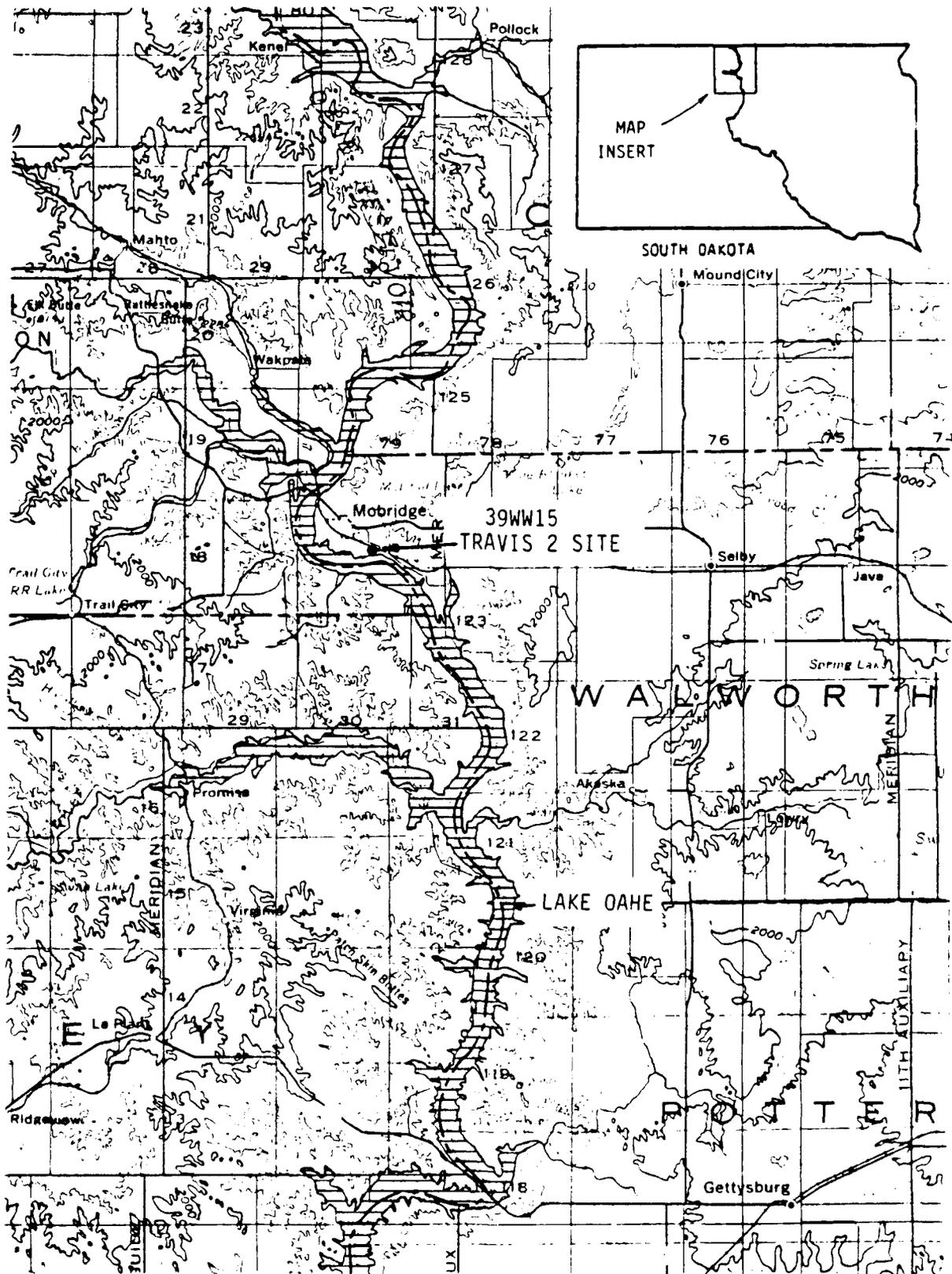


Figure 1.1. Map showing the general location of the Travis 2 site, 39WW15. Adapted from U.S.G.S., State of South Dakota map; approximate scale 1:490,000.

to the specifications for the Results chapter (Thomas K. Larson, letter to Richard Berg, 23 February 1988). The arrangement of certain information within the chapters in this report is therefore based on that modification.

**CHAPTER TWO
LOCATION AND ENVIRONMENTAL SETTING OF THE
TRAVIS 2 SITE**

Thomas K. Larson and Paul H. Sanders

Introduction

The Travis 2 site is located in north central South Dakota at an elevation between approximately 1605 and 1620 feet (489 to 494 m) above mean sea level (a.m.s.l.). The site is situated along beach and cutbank areas on the left bank of Lake Oahe (see Figure 1.1), a man-made reservoir which formed behind Oahe Dam after its completion in the early 1960s.

In 1976, the Travis 2 site was described as being "approximately 300 m in length parallel to the axis of the beachline, and generally no more than 60 meters in width perpendicular to the shoreline axis" (Ahler et al. 1977:11). Subsequent wave action and cutbank erosion have further damaged the site so the potential site size of 18,000 m² (i.e., 300 m by 60 m) as noted in 1976 has been reduced considerably (ca. 775 m²; see Chapter Seven and Chapter Eight). Unless checked in some way, periodic inundation and wave action will probably destroy the remainder of the site in the next five to ten years.

In addition to the impacts from Lake Oahe, a gravel mining operation appears to have destroyed some of the northern portions of the site. Ahler et al. (1977:11) note that the terrace on which the Travis 2 site is situated appeared to have been landscaped and leveled after the cessation of gravel mining operations. These activities were confirmed during the 1987 excavations.

The Travis 2 site is located on a narrow strip of Corps of Engineers administered shoreline. An unimproved road passes through the site and supplies access for recreational activities along the beach. At present, such activities do not appear to have significantly impacted the integrity of the cultural deposits. While increased use or improvement of the road through the site area could create additional impacts, these problems are viewed as far less serious than erosional activities of Lake Oahe.

The only documented vandalism to the Travis 2 site took place in September of 1978.

On or about Sept. 15-19, 1978, the site was visited by vandals apparently intent upon discovering collectible artifacts. Seven roughly circular potholes were dug in the site, all between the 420W line and the 440W line. The location of the potholes indicates that the people responsible were somewhat familiar with the general structure of the site. Inspection of the pothole excavations revealed that damage to the intact deposits was

either superficial or negligible [Weston, Goulding and Ahler 1979:10].

No signs of additional vandalism were noted during visits to the site in 1987, but it should be noted that any unauthorized digging in the beach area of the site would be quickly masked by wave action.

Physiographic Setting

The project area is located near the center of the Grand-Moreau region of the Middle Missouri subarea of the Plains area (Lehmer 1971). The Plains area is a geographic division discussed by Willey (1966) with reference to archeological manifestations but it is spatially nearly analogous to the Great Plains physiographic region of North America (e.g., Fenneman 1931).

Lehmer's (1971) definition of the Grand-Moreau region has recently been modified and used as one of several archeological "study units" within South Dakota. The study unit is defined as follows:

The Grand/Moreau study unit consists of the Missouri River valley trench and adjacent breaks in north central South Dakota. The eastern border of the study unit generally coincides with the Coteau du Missouri landform while the western edge of the study unit is roughly drawn at a point where the Grand and Moreau Rivers remain free-flowing (not affected by the pool elevation of Oahe Reservoir). The southern border of the study unit is arbitrarily drawn along a line parallel with the Potter-Sully County line west to Ziebach County. Present-day topography of the area consists of river terraces and break areas adjacent to the river. East and west of the breaks are plains covered by Pleistocene and Recent wind-blown loess deposits. Portions of Corson, Campbell, Dewey, Walworth, and Potter Counties are included in the Grand/Moreau study unit [Buechler 1984:47].

While quite similar to Lehmer's (1971:29) original definition of the Grand-Moreau region, the study unit as defined by Buechler is wider, extends slightly farther to the south, and continues farther northward to include all of the Missouri River trench up to the boundary between North Dakota and South Dakota (Buechler 1984:3).

The physiography of the Missouri River valley between the Grand and Moreau rivers has recently been described by McFaul and Sanders (1987:168-172).

The physiography in the study area consists of alluvial gravel fill terraces and extensive exposures of Cretaceous clay rich sediments littered with glacial erratics (Flint 1955; Hurt 1979). Erratics are found as far west as Goose Creek on the Moreau River (Flint 1955: Plate 1) and are easily identified on the divides between drainages. . . .

Both the alluvial terraces and the Cretaceous bedrock sediments are in part mantled with varying thicknesses of eolian loess. The eolian or wind blown loess sediments are the most recently

deposited sediments in the study area (Clayton et al. 1976; McFaul 1986; Sanders et al. 1987). They are found on the more gently sloping topography of the upland drainage divides and the alluvial gravel terraces of the Missouri Trench. Loess deposition is believed to correlate with dryer climatic events in the Holocene (Clayton et al. 1976). . . .

Four glaciofluvial terraces have been identified in the Moberge vicinity (McFaul 1986; Sanders et al. 1987). They are designated "Mt" for Missouri terrace and ordered by their ascending height above the Missouri River (after Coogan and Irving 1959). Three of these terraces (Mt4, Mt2, Mt1) are accumulation surfaces mantled with glaciofluvial gravels and loess sediments. The remaining terrace (Mt3) is an erosional wave cut terrace. . .

Clayton et al. (1976) have shown that terrace landforms, because of their gentle gradients, are excellent repositories for eolian sediments. They have also identified a late Wisconsin-Holocene sequence of alluvial sediments mantled by eolian loess in the Missouri River drainage near Riverdale, North Dakota. This sequence, termed the Oahe Formation, consists of four recognizable members; Mallard Island, Aggie Brown, Pick City, and Riverdale (Clayton et al. 1976: 11).

The Mallard Island is a very pale brown late Wisconsin sandy glacial melt water deposit dating to 11,000 years B.C. The Aggie Brown is a loess deposit that is divided into two submembers, a light brown 11,000 to 8,000 years B.C. soil B horizon overlain by a gray-very dark gray soil A horizon dating 8,000 to 6,500 years B.C. This distinct buried paleosol, the Leonard Paleosol (Bickley 1972), is mantled by the light gray carbonate-rich loess of the Pick City member which dates 6,500 to 3,000 years B.C. The Riverdale member is the youngest member of the Oahe Formation. It contains three loess submembers which date 3,000 years B.C. to present. The lower and upper submembers are grayish brown while the middle is a brownish gray. The lower Riverdale submember, the Thompson Paleosol, is a buried soil A horizon similar to the uppermost modern soil A horizon.

McFaul and Sanders (1987) suggest that the soil-sediment characteristics at the Travis 2 site correlate well with their definition of the Mt1 terrace, the lowest and most recent of the glaciofluvial terraces within this region of the Missouri River valley. Based on the 1976 testing at Travis 2, Ahler et al. (1977) tentatively identified the presence of the Riverdale, Pick City and Aggie Brown members of the Oahe formation lying on top of a gravel subunit believed to be Late Wisconsin in age.

Vegetation

The site is located in the Mixed-grass Prairie community (Dueholm and Sanders 1987) on level uplands. Dominant species in the uneroded portions of the site are midgrasses such as needle-and-thread (Stipa comata),

western wheatgrass (Agropyron smithii), and junegrass (Koeleria pyramidata). A lower stratum of shortgrasses or sedges is also present, including blue gramma (Bouteloua gracilis) and threadleaf sedge (Carex filifolia). Numerous forbs are present in Mixed-grass Prairie, but usually in low densities. They include biscuitroot (Lomatium spp.), Plains wild onion (Allium textile) and prairie turnip (Psoralea esculenta) early in the growing season and coneflower (Echinacea angustifolia), purple prairie clover (Petalostemon purpureum), blazing star (Liatris punctata), butterflyweed (Gaura coccinea) and silver scurfpea (Psoralea argophylla) later in the season.

A small stand of young timber is present near the western boundary of the site, with willows (Salix spp.) and cottonwood (Populus deltoides) saplings the dominant types. In the northern and eastern portions of the site there is a slight depression containing a thick growth of tall reeds (predominately Phragmites spp.).

Because of the vegetative cover on the portions of the site above the cutbank, it is estimated that only approximately 25 percent of the ground surface was visible during field work. The beach areas of the site are essentially barren of vegetation so that, except in those areas covered by stabilization materials laid down in April of 1978 (Weston, Goulding and Ahler 1979), nearly 100 percent of the beach was visible.

Pollen analyses were conducted from samples taken during the 1976 University of North Dakota excavations at the Travis 2 site. The single sample containing positive results indicated the presence of Graminae grasses, elm (Ulmus spp.), cottonwood (Populus sp.), broad-leaf cattail (Typha latifolia), and juniper (Juniperus sp.) as well as members of the Compositae and Ericaceae families and one specimen of either the genus Maclura or Celtis (Ahler et al. 1977:52). The results were interpreted and qualified as follows:

The pollen content in the sample suggests conditions relatively similar to today: grass dominated interfluves, mixed hardwood/cottonwood forests in the stream valleys, and mesic species immediately adjacent to the streams. This interpretation must obviously be considered extremely tentative, particularly considering that the sample is possibly from a reworked slopewash or stream channel deposit in an extremely localized micro-environment. . . [Ahler et al. 1977:50].

The pollen sample came from a dark brown sand at a depth of 102-110 cm (Ahler et al. 1977:51). No attempt was made to assign the sample to a particular cultural stratum.

Past and Present Land Use

To date the archeological investigations at the Travis 2 site have yielded very little information which can be used in the interpretation of specific site function(s). From field work conducted in 1976, Ahler et al. (1977:114) interpreted the material at the site to be the result of "multiple preceramic components. . . apparently representing intermittent occupation throughout the period from approximately 10,000 to 2,000 years

B.P." Prehistoric use of the site area was interpreted as follows:

The focal point of the early occupation of the Travis 2 site appears to have been a small, now extinct, intermittent stream or spring which drained from the edge of a broad glacial outwash terrace overlooking the Missouri River valley. . . .The site clearly represents a location where the performance of a variety of activities can be inferred, such as repair of hunting equipment, production of wood and bone tools, animal and plant food processing and consumption, manufacture of certain types of stone tools, and fire maintenance. These factors indicate that the Travis 2 site is an occupation location, probably seasonal or even shorter-term encampment [Ahler et al. 1977:114-115].

Little was found during the 1987 excavations to contradict the above description of the prehistoric use of the Travis 2 site. The present interpretation of site function is still rather generalized. Before function and use of the site can be further delineated it will be necessary to recover more ecofactual information and a greater portion of in situ artifact assemblage than is presently available.

Aerial photos of the site area taken prior to inundation (Ahler 1977:13) indicate that the Travis 2 site was probably located in a mixed-grass pasture approximately 1200 m north of the Missouri River channel. The site area was bordered on the west by a cultivated field and on the north by the gravel mining operations mentioned earlier. A small north to south stream channel passed by the eastern edge of the site. Today, the area which contained the cultivated field is completely under water and the gravel mining operations have been closed down, backfilled, and recontoured. The stream channel now forms a small inlet of Lake Oahe. The site area and surrounding shoreline are presently maintained by the Corps of Engineers for recreational uses including picnicking, fishing access, use of the beach, and vehicle paths.

Field Conditions

The 1987 archeological investigations at the Travis 2 site were begun on August 3 and completed on August 24. The field work was completed in two, eight-day sessions (August 3 through 10 and August 17 through 24) with a six day break in between. Paul H. Sanders and Thomas K. Larson served as principal investigators and field supervisors for the project. Other members of the field crew were Marianne Cartwright, Keith Dueholm, Steven Lund, Michael McFaul and Mara Wells.

Weather conditions were quite favorable for conducting field work, with mild summer temperatures and a slight breeze the usual pattern. Only one-half day was lost to rain.

The pool level of Lake Oahe varied only slightly during the field work. The level on August 3 was 1611.61 feet (491.22 m) a.m.s.l. When the water levels were last mapped at the site on August 19, the pool level had dropped to 1610.72 feet (490.95 m) a.m.s.l. (figures provided by the personnel at the Oahe Dam powerhouse).

CHAPTER THREE PREVIOUS ARCHEOLOGICAL INVESTIGATIONS

Thomas K. Larson

The majority of information concerning the history of investigations at the Travis 2 site was gathered from three earlier reports on the site (Ahler et al. 1977; Weston, Goulding and Ahler 1979; Ahler 1980) prepared by the University of North Dakota and submitted to the U.S. Army Corps of Engineers, Omaha District. Other data have been gathered from copies of field notes and maps obtained from the Department of Anthropology, University of North Dakota, Grand Forks, National Register information and site forms obtained from the South Dakota Archaeological Research Center, Rapid City, and personal communications with Mr. Marion Travis of Mobridge, South Dakota, Dr. Stanley A. Ahler, University of North Dakota, and Mr. Richard Berg, Archeologist with the Omaha District. In addition to the information presented in the following chapter, these sources of information were also used to aid in the interpretation of past and present findings at the site.

Mr. Marion Travis first recognized archeological materials on the beach location southeast of Mobridge, South Dakota in 1973. Mr. Travis reported his findings to Donald J. Lehmer in March of 1975. Dr. Lehmer informed Carl Falk at the National Park Service's Midwest Archeological Center and he in turn passed the information on to Stanley A. Ahler. Dr. Ahler visited the site in the fall of 1975 and photographed a portion of the Travis collections from the site (Ahler et al. 1977).

The artifacts which have stimulated the most interest at the Travis 2 site are a number of Paleoindian projectile points. By 1976, Travis had collected over 50 Paleoindian specimens along with a number of other point forms and other types of prehistoric artifacts. The apparent nature of the cultural deposits and the fact that these materials appeared to be eroding into Lake Oahe at a rapid rate caused the Corps of Engineers to initiate a series of actions at the site starting in 1976.

In September of 1976 the Omaha District issued a purchase order (DACW45-76-M-3846) to the University of North Dakota for surface collections, mapping and test excavations at the Travis 2 site. An analysis of the Marion Travis collections from the site was also undertaken as part of the project.

The purpose of the work was to evaluate the cultural content of the site, to determine if significant portions of the site remained intact, and to collect sufficient data to make recommendations to the Corps concerning the need for and specific nature of further mitigative action at the site [Ahler et al. 1977:2].

Dr. Ahler served as principal investigator for this and all subsequent University of North Dakota investigations at the Travis 2 site.

Field work was begun at the site on September 16, 1976. After constructing a contour map of the site and placing two datum markers, the University of North Dakota field crew initiated a surface collection on the beach area. The surface inspections resulted in the discovery of only a few new artifacts but did reveal a small scatter of fire-cracked rock eroding from the cutbank (Ahler et al. 1977).

The location of the feature in the cutbank and the areas of Paleoindian artifact concentrations noted by Mr. Travis were used as aids in the positioning of test excavation units. Twenty-eight m² within nine units were excavated in 1976. Ahler et al. (1977:22) estimate that 19.696 m² of undisturbed site matrix were excavated.

The 1976 investigations identified two in situ cultural zones; an upper level of unknown age associated with the fire-cracked rock feature and a lower zone in which two projectile point fragments were found that appeared similar to the majority of Paleoindian points collected from the beach by Travis (Ahler et al. 1977:45). In addition to the cultural materials, the excavations also investigated the natural stratigraphy at the site. Three natural stratigraphic units (A, B and C) were identified and paleoecological data, including soil sediment, pollen, and mollusk analyses, were processed for each unit (Ahler et al. 1977).

The University of North Dakota crew also investigated the horizontal distribution of the buried cultural material through use of a small diameter coring device. These investigations provided the first approximation of the extent and location of remaining deposits.

In sum, coring and excavation combined to define a narrow linear band of intact Unit A deposits. . . which presumably contain and overlie in situ cultural material in the main archeological zone. In the area where it was defined, this intact cultural zone would lie at depths varying from 0 to at least 100 cm below the present surface, and occurs in a band that is approximately 15 m in width paralleling the trend of the beach line [Ahler et al. 1977:47,49].

These cultural deposits were estimated to be approximately 80 m in length, but it was stated that the exact eastern and western limits were not specifically determined (Ahler et al. 1977:49).

As part of the 1976 work the field crew placed a series of wooden stakes above the cutbank. These were used by Marion Travis to provenience future finds on the beach. Ahler et al. (1977:49) note the discovery of a second area of cultural material in the eastern portions of the site by Mr. Travis after the completion of the field work. The distribution and character of these materials were discussed in detail in a later report (Weston, Goulding and Ahler 1979).

Based on the results of the analysis of the 1976 excavations and the Travis collections it was determined that the Travis 2 site had a good

potential for yielding further significant information.

. . .the Travis 2 site is one of the most significant archeological resources in the Northern Plains. Surface collections and excavated materials indicate that multiple preceramic components occur at the site, apparently representing intermittent occupation throughout the period from approximately 10,000 to 2,000 years B.P. . .While the cultural deposits have not been directly dated by C-14, technologically and typologically, these lanceolate points may be termed late Paleo-Indian in form, and apparently derive from a relatively brief period of occupation occurring during a period from 8000 to 10,000 years B.P. . . .

The significance of the Travis 2 site lies in part in the fact that it is one of less than a half dozen sites within the entire 800 miles of [the] Middle Missouri trench which are known to produce early preceramic archeological remains. . . .test excavations and surface reconnaissance at Travis 2 have revealed that a single (and perhaps second) early preceramic component appears to be both spatially and stratigraphically isolated from later occupations at the site, and that a considerable part of the early cultural materials remains in situ within the site deposits [Ahler et al. 1977:114].

A series of mitigation measures were recommended based on the results of the 1976 work. Although several types of mitigation were suggested, the form recommended involved "intensive and extensive salvage excavation of the site deposits and subsequent analysis and reporting of all recovered material" (Ahler et al. 1977:117). It was further proposed that the excavations should start as soon as low water levels and favorable field conditions would permit - August of 1978. Interim mitigative strategies prior to excavation were also proposed if lake levels would be high enough to damage the site. These consisted of controlled observations and surface collections of the beach area in order to monitor site erosion (Ahler et al. 1977).

The information supplied in the Ahler et al. (1977) report was used by the Corps of Engineers to complete a National Register of Historic Places nomination form for the Travis 2 site. The form was submitted to the Keeper of the National Register on September 20, 1977 and the site was officially determined eligible for nomination on November 1 of that year (Wood 1977; Murtagh 1977).

In the spring of 1978 it became obvious that melt waters would raise the level of Lake Oahe significantly and that the Travis 2 site would again be subjected to erosion. As a result the Corps of Engineers issued a second purchase order (DACW45-78-C-0102) to the University of North Dakota for monitoring and surface collections.

The major points in the agreement were for the University of North Dakota to place a two man crew in the Moberge area for the duration of the high water in 1978. These persons were to make controlled beach collections of newly eroded materials at the site; conduct in-the-field sorting, cataloging, and analysis of

artifact collections, and to write a report including information on the beach collections, and evaluation of the erosional situation, and new recommendations for further mitigative actions by the Corps [Weston, Goulding and Ahler 1979:3].

In April 1978, prior to the initiation of the University of North Dakota monitoring program, the Corps of Engineers took actions to temporarily protect the site deposits.

The emergency protection was applied in an area measuring approximately 78 m east-west (parallel to the beach line) and about 20-25 m north-south. The area covered. . .encompassed part of the intact deposits containing the early lanceolate point complexes. The Corps began by cutting and clearing brush and a dense stand of willows. . .and by clearing the area of large driftwood logs. The area was completely covered with a layer of clear sheet plastic which was then overlain by parallel strips of wood and wire snow fencing. The snow fence was rolled out from the high, undisturbed ground surface down the beach and into the water. Some spacing was left between the strips of snow fence, and the whole area was partially covered with a layer of beach sand to help keep the plastic in place. The protective layering was further stabilized by driving a large number of steel fenceposts through the snow fence into the ground, with the snow fence then wired to the fenceposts at the ground surface. . . .In order to keep the underwater parts of the mat from floating and moving about in wave action, several sections of steel railroad rail were placed over the ends of the snow fence strips under water. Finally, the upper end of the snow fence and plastic mat, which was located on the undisturbed high terrace above the 1975 cutbank, was secured beneath several large driftwood logs [Weston, Goulding and Ahler 1979:6].

Weston, Goulding and Ahler (1979) indicate that the protective measures did not completely cover the known limits of intact cultural deposits. The remnants of the emergency protection matting are discussed in later chapters of this report.

In addition to the controlled surface collections the 1978 field work also involved making a new contour map of the site and using a small diameter coring tool to assess the extent of the remaining in situ cultural deposits. Two permanent grid markers were also established at the site.

The results from the 1978 field work clearly indicated that additional portions of the Travis 2 site had been destroyed since 1976.

The part of the early subsurface deposits most severely affected by 1978 erosion is along the southern margin of the previously uneroded area. The data indicate that approximately 1-2 lateral meters (north-south) of the intact deposits have been completely removed by erosion along this southern margin area. Also, throughout the southern half of the intact zone, ca. 20-30 vertical cm of the overlying Unit A, silty deposits, have been removed [Weston, Goulding and Ahler 1979:11].

The investigations also more accurately established the western edge of the intact deposits and found that the buried materials extended farther to the north and east than had been previously believed.

The net effect of erosion and continuing investigations has been to document the removal of 50-60 m² of previously intact early cultural deposits and to suggest that the horizontal extent of the intact zone may have been somewhat larger than originally thought. Based on the 1976 work, it was estimated that the intact lanceolate zone of cultural deposits was minimally 600 m² in extent, and probably as large as 1200 m². The 1978 data clearly reveal that a part of that zone of interest has been removed. The erosional removal, however, is estimated to reflect no more than a maximum of 10% reduction in the areal extent of the early deposits, meaning that the possible mitigative situation facing the Corps of Engineers is, as a whole, little changed [Weston, Goulding and Ahler 1979:14].

A number of projectile points were collected by Marion Travis and the University of North Dakota field crew during the time span from the completion of the 1976 investigations through the 1978 field work. Because locational data were carefully maintained on these specimens it was possible to differentiate horizontal patterning for both the Paleoindian lanceolate materials and the later, non-lanceolate items. The later materials were found much farther east than the lanceolate projectile point, centered between the 290W and 310W grid lines (Weston, Goulding and Ahler 1979:17).

To summarize, two reasonably distinct and well-defined cultural components are represented on the beach at Travis 2. The first . . . is characterized by high densities of lithic debris, stone tools, fire-cracked rock and faunal remains eroding from the sloping beach surface. A number of typologically distinct projectile points occur throughout this part of the site; it appears that the component is definitely preceramic in age and probably relates to the middle to early part of the Foraging or Plains Archaic Period. This area underwent intensive erosion in 1978. . .

The second concentration of materials marking an earlier component at the site occurs in a much more diffuse area from about 350W to 500W. This component is characterized by moderate frequencies of stone tools and flaking debris; there is little evidence of fire-cracked rock or preserved faunal remains. This component is distinguished by the occurrence of a single class of lanceolate projectile point resembling the Angostura point which is generally found in sites farther to the west. . . [Weston, Goulding and Ahler 1979:26].

University of Nebraska field crews visited the Travis 2 site in the summer of 1979 as part of a cultural resource inventory along the left bank of Lake Oahe. While no mapping, collecting or excavations were undertaken, the site was photographed and it was noted that the erosion was continuing (Richard Berg, Corps of Engineers, personal communication, January, 1988). The University of Nebraska also compiled a site survey form for Travis 2,

apparently the first one ever completed for the property.

The Corps of Engineers issued a third purchase order (DACW45-80-M-0247) to the University of North Dakota in October of 1979. Monitoring was necessary because of a new episode of erosion which took place in 1979. The condition of the Travis 2 site was to be evaluated and recommendations were to be made regarding mitigation alternatives.

A new contour map of the site was constructed and a small diameter coring tool was used to determine the extent and thickness of the culture bearing zone in the western part of the site. A small amount of surface collection also took place (Ahler 1980). The findings were summarized as follows:

To summarize, the 1979 erosional episode was approximately equally as severe as that in the previous year. In the western part of the site where the earliest cultural deposits apparently occur, the intact cultural zone was again reduced in area by about 4 to 5% from the 1976 area. Erosion there was again most severe on the downslope edge of the cultural zone; damage was less severe or non-existent along the northern part of the area near the cutbank where temporary stabilization efforts were conducted by the Corps in 1978. At the present time, it appears that approximately 85 to 90% of the intact cultural zone as defined in 1976 remains undisturbed, although it is becoming progressively more shallow, particularly along its southern edge.

To the east, the Unit A silt deposit dips and thickens and is known to contain a variety of later preceramic cultural materials. Erosion was relatively severe in the eastern half of the site, judging from a significant recession in the cutbank location in that area, but subsurface stratigraphic information are too limited for that part of the site to make qualified estimates of the volume removed or percentage of culture-bearing deposits remaining intact. Concentrations of in situ cultural debris were observed again in 1979 protruding from the scoured beach surface in that part of the site, verifying that at least some undisturbed cultural deposits still remain intact in that area [Ahler 1980:13].

As a result of the 1979 field work Ahler (1980) proposed two possible mitigation strategies. One alternative proposed was to stabilize the remaining site area and prepare a final report on the site area, including a detailed artifact analysis of the Travis and University of North Dakota collections. The second alternative proposed was salvage excavation of approximately 200 m² of site area, primarily in the western part of the site, and preparation of a final report. No opinions were expressed on the favorability of one mitigation measure over the other (Ahler 1980:15-24). It was recommended, however, that one or the other of the alternatives be initiated as soon as possible.

The present scope of work calls for a review of "the general adequacy and deficiencies of the past work" (Corps of Engineers 1986:4). From the standpoint of archeological methods and techniques the past work by the University of North Dakota seems both adequate and appropriate for the

site. The principal investigator also appears to have fulfilled his professional obligations in repeatedly warning the Corps about the continuing destruction of the site's deposits.

From the standpoint of the current investigations it is possible to develop a sort of "wish list" concerning the types of activities which might have benefited the site but were never carried out. This discussion should not necessarily be viewed as a listing of deficiencies of the previous work since most of these conclusions can only be drawn with the benefit of hindsight.

Had it been known ahead of time that neither permanent stabilization measures nor salvage excavations would be instituted within the time frames recommended by the original investigators, it might have been more productive to use the funding expended on monitoring for excavation. While this funding (approximately \$17,000) would never have been sufficient to salvage the site, it might have been possible to excavate a single block area in the best part of the site in order to recover datable materials and gather more information about the characteristics of the Paleoindian occupation level.

It is unfortunate that it was not possible to put some test excavations in the eastern portion of the site believed to contain later (i.e., post-Paleoindian) cultural deposits. As will be discussed in subsequent chapters within this report, it now seems likely that these components have been completely destroyed by erosion. No matter how significant the Paleoindian deposits are at the Travis 2 site, just as good an argument could probably be made for the significance of Middle Archaic and/or Early Archaic levels believed to contain "high densities of lithic debris, stone tools, fire-cracked rock and faunal remains" (Weston, Goulding and Ahler 1978:26).

Rather than "deficiencies of past work," it is perhaps the lack of work itself which is the major deficiency that stands out when the reviewing previous investigations at Travis 2 site. The gradual destruction of the site area by the actions of Lake Oahe is relentlessly reducing the information content at the site and is, at the same time, severely restricting the options available as viable mitigative measures.

CHAPTER FOUR CULTURAL COMPONENTS AT THE TRAVIS 2 SITE

Thomas K. Larson

The best discussion of the potential cultural components at the Travis 2 site is presented in the first investigative report (Ahler et al. 1977) as part of an analysis of the functional and descriptive artifact categories represented. A later report (Weston, Goulding and Ahler 1979) added additional information concerning the horizontal distribution of projectile point forms. With the exception of several ceramic sherds, all cultural diagnostics are projectile points.

Except for two specimens from the main Paleoindian level, all of the information relating to temporal and cultural diagnostics at the site comes from surface finds. As such, the following discussion of cultural components and their relationship to the known regional culture history should not be viewed as a discussion of identified, in situ, cultural levels. Again, with the exception of the main Paleoindian level, it now seems very unlikely that the majority of the components discussed below will ever be found within an excavated context at the site. The discussion which follows proceeds from the most recent manifestations to those believed to be the oldest.

The cultural-chronologic terminology used in the discussion generally follows that presented in Larson et al. (1986). This is very similar to the names and dating ranges specified by Buechler (1984) for South Dakota study units with the exception that "Woodland" is considered to consist of a series of variants which cross-cut temporal boundary markers (Larson et al. 1986:32,36). Buechler's (1984:49) limited discussion of Woodland within the Grand-Moreau Study Unit mentions only Late Archaic, Besant materials; Plains Village is indicated to be the tradition which follows the Late Archaic-Woodland. Such an interpretation would seem to overlook a number of Late Woodland components which have now been recognized along the Middle Missouri River and its tributaries (e.g., Ahler, Lee and Falk 1981; Benn 1981; Gregg et al. 1986; Campbell, Noisat and Hughes 1983).

A scattering of materials identified as Plains Village have been collected near the eastern end of the Travis 2 site. The Plains Village tradition of the Middle Missouri has been divided into two separate subareal traditions: Middle Missouri and Coalescent (Lehmer 1971). Based on the characteristics of several pottery sherds and the close proximity of Travis 2 to the Larson site, 39WW2, Ahler et al. (1977) hypothesize that the Plains Village materials are probably related to the Coalescent tradition. If the materials at Travis 2 are related to the occupation of the Larson site they would date from the early part of the Post-Contact variant of the Coalescent, probably between A.D. 1750 and 1785 (Owsley, Berryman and Bass 1977). These findings are consistent with the presence of additional Coalescent ceramics at the Sewer Bay site, 39WW41, located immediately across a small inlet from the eastern end of Travis 2 (Weston,

Goulding and Ahler 1979:Appendix D).

A small arrow point made from white chalcedony was found on the beach during the 1987 investigations (Figure 4.1a). The corner-notched specimen probably dates from the early part of the Late Prehistoric Period and may relate to the Late Woodland variant (ca. A.D. 400 to A.D. 900). Metric and descriptive attributes of the specimen are presented in Table 4.1.

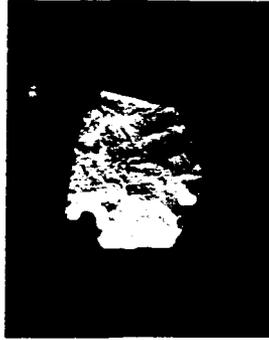
A number of projectile points have been collected which are believed to be "at least pre-Plains Village Period, and probably preceramic in age" (Ahler et al. 1977:65). Four specimens (Type 6) are medium sized, corner-notched specimens which are described as similar to Table Rock points from Missouri and probably Late Archaic in age (Ahler et al. 1977). Ahler et al.'s (1977) projectile point types 5, 11 and 12 appear to be similar to medium size corner-notched and side-notched dart points found at other sites on the Plains (e.g., Frison 1978) in Late Plains Archaic contexts (ca. 1000 B.C. to A.D. 400).

A slight exception is taken to the Ahler et al. (1977:65) interpretation of the Type 16 projectile points as being "a relatively late placement in the pre-Plains Village Period, although no directly comparable specimens are known from dated or stratified contexts." These specimens, along with projectile point Type 7 (Ahler et al. 1977:68), appear similar to either or both McKean complex and Oxbow materials from the Northern and Northwestern Plains (e.g., Mulloy 1954; Reeves 1973; Wheeler 1985) and as such could date anywhere from the latter parts of the Early Plains Archaic into the Middle Plains Archaic (ca. 3200 to 1000 B.C.). As Ahler et al. (1977) note, points similar to the Type 7 specimens were found in a level dated at 8030 ± 1100 years (6080 B.C.) at the Walth Bay site, 39WW203 (Ahler et al. 1974). However that level is stratigraphically above another one dated at 7010 ± 210 years (5060 B.C.) and the date must be considered suspect.

Ahler et al. (1977:69,71) assign three projectile point types (15, 17 and 23) to the "early preceramic." The first two types are large and medium size side-notched points. These appear very similar to Early Plains Archaic specimens from the Northwestern Plains (e.g., Frison, Wilson and Wilson 1976) as well as those from late Paleoindian/Early Archaic levels in the Prairie Peninsula (Anderson and Semken 1980). As such, these materials possibly date between ca. 6500 and 4500 B.C. The third type of early preceramic point is a thin, unnotched variety similar to those from the Medicine Crow site and sub-mound deposits in the Big Bend area (Ahler et al. 1977:71).

Over 75 projectile point specimens which appear to be Paleoindian in form and age have been collected at the Travis 2 site. The vast majority (at least 35) of these fall into the Ahler et al. (1977) Type 26 category.

These points are characterized by a distinctly tapered or contracting haft element set off by moderate (54%) or pronounced (43%) lateral haft edge grinding or dulling. Lateral edge dulling extends approximately to the point of greatest width, which, on nearly all specimens complete enough to observe, occurs at a point approximately 45% of the total length from the basal margin. Basal margins are highly variable in outline, varying



a



b

Figure 4.1. Projectile points from the Travis 2 site, 39WW15 (actual size).

Table 4.1. Projectile point measurements and attributes.

Corner-notched point (#39WW15-33)

<u>Variable</u>		<u>Comments</u>
Total Length	21.0mm	Tip missing
Maximum Width	17.8mm	
Basal Width	11.6mm	Extreme corners missing
Length from Base to Notch Constriction	0.5mm	
Notch Width	11.2mm	
Maximum Thickness	4.7mm	
Basal Incurvature	0.0mm	
Weight	1.70g	
Raw Material Type	White Chalcedony	

Lanceolate point (#39WW15-34)

<u>Variable</u>		<u>Comments</u>
Total Length	42.1mm	
Maximum Width	20.8mm	
Basal Width	14.2mm	
Length from Base to Maximum Width	20.2mm	
Maximum Thickness	6.4mm	
Basal Incurvature	0.6mm	
Length of Lateral Dulling	0.0mm	Some minor basal dulling
Weight	5.65g	
Raw Material Type	Knife River Flint	

from slightly excurvate (23%) to straight (26%) to incurvate (51%), with a few examples of distinct incurvature. . .Basal edge dulling, of moderate intensity, is observed on only about 14% of the specimens. . . .Forty percent of the specimens exhibit some degree of parallel-oblique flaking on both faces; 26% exhibit parallel-oblique flaking on one face in combination with random flaking on the other, 6% exhibit collateral or parallel-transverse flaking on one face and parallel-oblique on the other. . .and the remainder (29%) exhibit random flaking on both faces. . . .All artifacts exhibit a biconvex transverse cross-section [Ahler et al. 1977:72].

The percentages listed in the above quote are based on the 33 Type 26 specimens which had been collected by the fall of 1976. The basal element of another Type 26 specimen was recovered from excavations during the 1978 field work and another was found during the most recent investigations (see below).

A lanceolate projectile point (Figure 4.1b) that was collected from the beach during the 1987 investigations seems to conform to the characteristics of the Type 26 points. This specimen, manufactured from Knife River flint, varies slightly from the other described points in that a slight shoulder is present along one edge, just at the top of the basal grinding (see Figure 4.1b). This shoulder may be fortuitous, however, since it is quite shallow and is formed by an oblique rather than a right angle indent from the blade margin. Other characteristics of the specimen are listed in Table 4.1.

The Type 26 specimens from the Travis 2 site are similar to a number of named parallel-oblique flaked forms (e.g., Frison 1978:34-40) dating from the late Paleoindian period (ca. 7500 to 5600 B.C.). They are perhaps most similar to Angostura points, first described at the Ray Long site, 39FA65 (Wheeler 1957; Hannus 1986) in a level dated at 9380 ± 500 years B.P. (7430 B.C.).

Ahler et al. (1977:70) illustrate two projectile points referred to as "Type 25," but they are discussed no where in the text other than being classified as Paleoindian. These specimens are similar to the Type 26 points but taper to a much narrower base which is very concave, approaching a notch, and which appears to have small, rounded basal ears. These specimens, especially in their basal characteristics, vaguely resemble late Paleoindian specimens from northern Wyoming and southern Montana (e.g., Husted 1969; Frison 1978; McCracken et al. 1978) and Humbolt points from the Great Basin (e.g., Aikens 1970). The single complete Type 25 specimen, however, appears larger and has a much more uniform parallel-oblique flaking pattern than do the majority of the specimens from farther to the west.

The earliest diagnostic artifact from the Travis 2 site is a single Eden/Scottsbluff projectile point from the Cody complex. Similar artifacts have been found in levels dating from between 6890 and 5930 B.C. at the Cody complex type site (Frison and Todd 1987).

CHAPTER FIVE RESEARCH ORIENTATION

Paul H. Sanders and Thomas K. Larson

Buechler has posed a series of research questions and goals for the Grand/Moreau study unit. Of these research topics, the ones that appear potentially relevant to the Travis 2 site are:

- 1) The resolution of typological questions about the relationships of Paleo-Indian sites with others in the northwestern Plains.
- 2) Further investigations into the potential for additional deeply-buried Paleo-Indian sites in the area. . .as well [as] environmental studies that address Paleo-Indian utilization of the area.
- 3) The effects of the Altithermal on populations of the Missouri River trench may also be addressed.
- 4) The question of whether the Grand/Moreau study unit was intensively occupied by early populations or if the data base is the result of research bias caused (thankfully) by the presence of an avid lay archaeologist (Marion Travis) [Buechler 1984:50].

The previous investigations at Travis 2 (Ahler et al. 1977; Weston, Goulding and Ahler 1979; Ahler 1980) have yielded information which serves to articulate the general research questions listed above with site-specific areas of investigation.

The major emphasis would be on the maximization of information concerning the early prehistoric cultures which have inhabited the Travis 2 locality, including information on their technology, subsistence, and surrounding cultural and natural environments. We would be interested in answering specific questions, such as: Who were the prehistoric cultures who used the site? At what specific times in prehistory was the site occupied? What activities were carried on within the site? What was the general lifestyle, technology, and subsistence base of the prehistoric inhabitants? What sections of the site were chosen for occupation or other activities? What were the natural environmental factors at the locality which led to its use by prehistoric peoples? What was the geological and geomorphological setting of the site locality at the time(s) of occupation, and how might we use information on the geological context of the artifactual remains to predict where similar, early habitation locations might be found within the Missouri

River valley? What was the nature of the climate at the time(s) of occupation, and how did it differ from our modern climate? [Ahler 1980:21].

These questions were proposed to be addressed within the context of an extensive mitigation plan. While one could not hope to answer all of them during the limited 1987 investigations, emphasis was placed on gathering as much information as possible relevant to these questions. Ahler's (1980) research questions were also used as a guide to determine the appropriate data recovery and analytical techniques.

Since the 1987 work at Travis 2 involved only limited subsurface excavation in areas of the site not known to contain extensive amounts of cultural material, it seemed only reasonable to considerably reduce the scope to the research questions to be asked. The major research questions that were to be addressed in the investigations are listed below (Larson-Tibesar Associates 1987:3).

- 1) If there is some spatial and stratigraphic separation in the various preceramic components, as Ahler et al. (1977:114) suggest, are there subsequent differences in cultural material (e.g., tool types, lithic resource utilization, features, faunal or floral remains) which would indicate different activities and utilization of the site area by the various occupants?
- 2) What are the vertical and horizontal limits of the site?
- 3) What is the integrity of the site?

In order to develop reliable answers to these questions it is necessary to properly recover, analyze and describe surface and subsurface artifactual materials. In addition, other types of studies, when they are possible, would add a great deal of information concerning the function(s), distribution and integrity of the site. These include:

- 1) C-14 dating of various cultural components in order to more firmly place the components within the regional cultural chronology.
- 2) Analysis of feature fill for faunal and floral remains, possible indicators of paleoenvironmental conditions and differential utilization of the site area.
- 3) Opal phytolith, pollen, mollusk and soil sediment analyses of selected matrix samples in order to recover paleoenvironmental data and to use as indicators of the depositional origin of stratigraphic levels within the site. All of these analyses can also be used as an aid to correlate new excavations with previous ones. Additionally, they serve as potential indicators of site integrity.

The results from the 1987 excavations placed certain limits on the types of analyses which were ultimately conducted. With the exception of several small bone scraps, no C-14 datable materials were recovered. None of the bone was dated since it was found dispersed in the soil matrix with no associated (or at least recognizable) cultural levels or features. No

features were discovered in excavation and it was therefore not possible to analyze feature fill for faunal and floral remains. The techniques of data recovery and analyses which were possible are discussed in the following chapter.

CHAPTER SIX STUDY METHODS

Paul H. Sanders, Michael L. McFaul, Linda Scott Cummings,
Susan C. Mulholland, George Rapp, Jr. and Larry Grantham

Introduction

This chapter presents the field and analytical methods utilized during the 1987 archeological investigations of the Travis 2 site. The investigations consisted of surface and topographic mapping, hand and mechanical excavation in order to determine site boundaries and integrity, as well as analysis of all the resultant materials.

At the time of Larson-Tibesar Associates' original proposal it was realized that the pool levels of Lake Oahe during the summer and fall of 1987 would be a critical factor in determining the types of field work that could be carried out. It was known that, should the pool level of the lake not drop to between 1605 and 1607 feet (489 to 490 m) a.m.s.l., it might not be possible to conduct investigations exactly to the specifications listed in the original scope of work (Corps of Engineers 1986). A series of options were therefore proposed should the lake level be higher.

Three options are presented to account for this situation. The first is to wait until the lake level reaches the accepted level (1607?) before initiating fieldwork. Depending upon release rates, the fieldwork may have to be delayed until late summer or fall. The second option is to initiate fieldwork this summer, but if lake levels are still considered too high, restrict the excavation to the upper portion of the site which should be relatively dry. In this situation, all the excavations figures (20 square meters of hand excavation and 150 square meters of backhoe trenches) would be utilized in this area with no further work on the beach.

The third option would be to stay within the guidelines of the scope of work in terms of the placement of the excavation units and initiate excavation of the northern portion of the site upon receiving contract award and notice to proceed. Later, when lake levels had dropped, schedule another field session to continue the excavation of areas along the beach. This latter option is the least desirable as it could require reopening excavation units in order to continue stratigraphic profiles and ultimately result in some inconsistencies in data recordation [Larson-Tibesar Associates 1987:6].

As it turned out, by the time field work was scheduled to begin (August 3, 1987), the level of the lake had dropped significantly, but not to the desired 1605 to 1607 feet a.m.s.l. Inspection of the beach area

indicated the level of the lake would not interfere with the original specifications and it was decided to begin field work without invoking any of the options discussed in the preceding quote.

A word should be said concerning the collection of bulk matrix samples for various types of specialized testing. All such samples were collected from a single excavation unit - 24-26 m S/69-70 m W. This unit was selected for sample collection because it (a) revealed some of the best vertical separation of identifiable strata and (b) was near areas previously tested by the University of North Dakota. The latter point was viewed as important since one of the main goals of the various bulk sample analyses was to attempt to replicate and/or substantiate the results from similar studies conducted in connection with the 1976 excavations (Ahler et al. 1977). It was believed that such studies would aid in identifying and correlating the new excavation results with the previously defined natural strata at the site. The locations of the samples taken are shown on the profile drawing which accompanies the discussion in Chapter Seven of Excavation Unit 24-26 m S/69-70 m W. Five liters were collected from each sample location; two liters for mollusk analysis and one liter each for pollen, opal phytolith and soil sediment analysis.

Literature and Records Search

The most critical data concerning the Travis 2 site was found to be contained in three earlier reports on the site (Ahler et al. 1977; Weston, Goulding and Ahler 1979; Ahler 1980) prepared by the University of North Dakota and submitted to the U.S. Army Corps of Engineers, Omaha District. These reports were consulted prior to field work, during field work, and in preparation of the final report. Other data have been gathered from copies of field notes and maps obtained by Paul Sanders from the Department of Anthropology, University of North Dakota, Grand Forks in June of 1987. National Register information and site forms were obtained from the South Dakota Archaeological Research Center, Rapid City. Personal communications also took place with Mr. Marion Travis of Mobridge, South Dakota, Dr. Stanley A. Ahler, University of North Dakota, and Mr. Richard Berg, Archeologist with the Omaha District.

Field Techniques

The field investigations consisted of surface and topographic mapping, excavation of two backhoe trenches, excavation of 20 m² within 11 excavation units and the digging of 22 shovel tests. The major focus of the investigations was the northern and western portions of the site where the most intact and oldest components are believed to occur.

Site Mapping and Establishment of Coordinates:

The initial step in the field investigations consisted of an attempt to relocate the permanent datum markers placed in the site by the University of North Dakota field crews in 1978 (Weston, Goulding and Ahler 1979). Mr. Marion Travis was contacted concerning the location of these datum markers but he could only recall their general location. Probable

areas were intensively inspected for the markers but they could not be located during the first field session.

A single wooden stake was located which appeared to coincide with the base line established for previous surface collections and monitoring studies (e.g., Ahler 1980). While it was believed the stake was part of the base line, it was not initially possible to determine its exact coordinates. Since it was necessary to begin excavations as soon as possible, the 1987 grid was established using this wooden stake as the 0 m North/0 m West point.

An attempt was made to establish the 1987 grid along a base line 25 degrees east of magnetic north, corresponding to the orientation of University of North Dakota's grid (Ahler et al. 1977:14). Wooden stakes were placed at 10 meter intervals east and west along the 0 m North line. All hand excavated units were oriented according to this grid with proveniences based on the 1987 0 m North/0 m West temporary datum point.

During the second session of the field investigations, the University of North Dakota's two permanent metal datum stakes were relocated using a metal detector. As a result, the wooden stake used as the 1987 0 m North/0 m West datum was found to correspond to University of North Dakota's 355 m North/410 m West stake. By using the permanent datum markers, it was also determined the 1987 grid had was off by one degree (24 degrees rather than 25 degrees east of magnetic north). Since work had already begun on the hand excavation units it was deemed inadvisable to either reposition their locations or redesignate their horizontal proveniences. As such, all excavation units are referenced in this report and in the field notes relative to the 1987 0 m North/0 m West temporary datum and a base line established 24 degrees east of magnetic north. Assuming north and east to be positive coordinates and south and west to be negative coordinates, the following formulas can be used to convert the locations of the 1987 excavation units into coordinates on the original University of North Dakota grid:

$$\begin{aligned} \text{north-south} &= (\text{1987 north-south coordinate} \times .999848^*) + 355 \\ \text{east-west} &= (\text{1987 east-west coordinate} \times .999848) - 410 \end{aligned}$$

$$* .999848 = \text{COS of 1 degree}$$

Since the original grid had been re-established by the time they were dug, shovel test coordinates were expressed using the University of North Dakota's grid system.

Surface mapping consisted of recording pertinent topographic features, such as the edge of the terrace/cutbank, water edge and the two track road which parallels the cutbank, as well as any cultural materials located during the surface reconnaissance. The surface mapping was accomplished using a transit, metric stadia rod and metric chain.

Elevational control was established by taking a reading at the surface of Lake Oahe on August 21, 1987 and setting a wooden stake at this elevation. The pool level on that date was 1610.72 feet (490.95 m) a.m.s.l. (information provided by personnel at the Oahe Dam powerhouse). A

series of elevation readings were taken of the northwest corner of the excavation units, at two meter intervals along Backhoe Trench 1, and at ten meter intervals along the beach and upper terrace surface. These elevations provided the basis for a contour map of the site.

Surface Reconnaissance:

The beach area of the site was inspected twice during the field work by means of pedestrian surveys with personnel spaced approximately two meters apart and inspecting the area with ground sweeps parallel to the cutbank. The area examined corresponds to approximately 200 m West to 600 m West on the original grid system. Two projectile points and two bone fragments were located and collected in the western portion of the site while three flakes were found near the eastern end of the site. The flakes were marked with pin flags one afternoon with the intent of mapping and collecting them the following morning. Unfortunately, the flags were washed away before their locations could be mapped and it was never possible to relocate the flakes. All cutbanks and the surface exposures in the two track road were also examined thoroughly but no cultural materials were found. Conversations with Marion Travis indicate that he has observed very little cultural materials at the site since the early 1980s.

Excavation Units:

The scope of work called for the hand excavation of approximately 20 square meters with units to be placed along the western, eastern and northern margins of the site. The actual placement of these units was based on information derived from the surface mapping and local geological characteristics. Four one-by-one meter, one one-by-four meter and seven one-by-two meter units were excavated.

The northwest corner of each unit was used for an elevational control point. Each unit was excavated with trowels and shovels in arbitrary ten cm levels with excavated matrix water screened through one-sixteenth inch (.16 cm) mesh. Each unit was excavated to culturally sterile deposits corresponding to Ahler et al.'s (1977) Unit C. Depending on local conditions this was either a dense gray clay or alluvial gravels.

Profiles of the north and west walls of each test unit were drawn and photographed. Standardized descriptions of the profiles were completed by Mr. Michael L. McFaul of LaRamie Soils Service, Laramie, Wyoming. These descriptions included sediment color, texture, and carbonate accumulations. All excavation units were backfilled with culturally sterile beach sands and gravels at the end of the second field session.

Shovel Testing:

A series of shovel tests were excavated along the upper terrace adjacent to the cutbank and two track road. The purpose of these units was to establish the site extent within this area of intact soil. This was considered to be extremely important since this area had not been subjected to inundation by Lake Oahe and it was thought possible that intact cultural

deposits might occur in this untested area. The shovel tests were located at ten meter intervals along the University of North Dakota's 345 North and 355 North line. Thirteen shovel tests were excavated from 350 West to 470 West along the 345 North line while nine were excavated from 370 West to 450 West. The tests were approximately 40 centimeters in diameter and were excavated in 20 centimeter levels. All matrix was water screened through one-sixteenth inch mesh. Each shovel test was excavated to culturally sterile deposits. All shovel tests were backfilled with beach gravel.

Mechanical Excavation:

Two backhoe trenches were excavated to examine site stratigraphy and extent as well as to uncover potential cultural features. Prior to excavation, the loose gravel and driftwood layer covering the beach was scraped back. It was originally intended to mechanically screen the excavated matrix through one-quarter inch mesh. However, the sediments would not pass efficiently through the screen due to their high moisture and clay content. The method was abandoned after it was found that one screen load took over an hour to screen with the aid of water hoses. The remaining matrix was visually examined by two archeologists for cultural materials as it was being excavated. Each trench was excavated to a depth well below any culture-bearing strata.

Backhoe Trench 1 was excavated across the beach and upper terrace to the edge of the two track road. It was twenty meters long and oriented perpendicular to the waterline. Its location cuts across the eastern edge of the area marked in the University of North Dakota's reports (e.g., Ahler 1980) as an intact cultural zone. Backhoe Trench 2 was eight meters long and excavated on the upper terrace in an area from the two track road along approximate grid north towards the old gravel quarry. One wall of each trench was drawn and photographed. Both trenches were mechanically backfilled using their original matrix.

Analytical Techniques

Lithic Analysis:

Only three tools, two projectile points and a biface, were found during the 1987 field work. As such, it is not believed necessary to describe in detail the descriptive/functional artifact categories used in analysis. Instead, each of these artifacts is described in detail and they are compared and classified according to the established artifact types used by Ahler et al. (1977). Since the projectile points are considered temporally diagnostic, they have been discussed in greatest detail within Chapter Four. The biface is discussed in Chapter Seven.

Where possible, lithic source analysis for both tools and debitage follows the terminology used by Ahler (1977). All lithic debitage was size graded, separated into the various raw material types and counted and weighed. Size grades utilized in the study include:

- G0 - Grade 0. 2.00 inch (50.8 mm) screen opening
- G1 - Grade 1. 1.00 inch (25.4 mm) screen opening

- G2 - Grade 2. 0.50 inch (12.7 mm) screen opening
- G3 - Grade 3. 0.223 inch (5.66 mm) screen opening
- G4 - Grade 4. 0.100 inch (2.54 mm) screen opening
- G5 - Grade 5. 0.046 inch (1.18 mm) screen opening

Flakes were also categorized based on the the amount of cortex which they retain on their dorsal surface. These designations are primary (100 percent covered with cortex), secondary (1 to 99 percent covered with cortex) and tertiary (no cortex).

The degree of patination on Knife River flint artifacts was described and compared to those recorded by Ahler et al. (1977). This attribute may be a key in determining the degree of exposure prior to burial and may be useful as a general indicator of site integrity. Ahler et al. (1977:76) noted differences in degree of patination from one side of an artifact to the other, suggesting little movement prior to burial.

Analysis of Faunal Remains:

Identification of the recovered faunal remains was done by Thomas K. Larson through the use of comparative specimens. Where possible, the faunal remains were identified to species, element and side. Identifiable remains were so few that calculation of minimum number of individuals was not viewed as appropriate. Unidentified bone fragments were size graded (see above), weighed and counted by excavation unit and level. It was not possible to gather additional information concerning butchering patterns, preference of species hunted or age of the individuals represented.

Analytical Techniques for Soil Sediment Studies:

Five soil samples from excavation unit 24-26 m S/69-70 m W were collected in the field and submitted to LaRamie Soils Service of Laramie, Wyoming for seiment analysis. All samples were assessed as to the percentages of calcium carbonate, sand, silt and clay. Soil pH, soil texture, geologic texture, relative amounts of effervescence, and color were also recorded.

Calcium carbonate percentages were determined on the five samples following the sulfuric acid titration method of Piper (1950). One of the five samples was chosen at random and rerun to ensure accuracy. Color determinations were made by comparing moist and dry soil samples with color chips on the Munsell soil color chart (Munsell Color 1975).

Soil pH was determined using the 1:1 soil/distilled water method employed by Dr. Richard Reider in his soil laboratory at the University of Wyoming. The method is a hybrid of that recommended by both the makers of the Soil Test digital pH meter and the Soil Conservation Service (1984). The Reider method suggests reading the instrument immediately after dilution with water while the Soil Conservation Service suggests allowing the sample to set overnight. The Reider method requires 30 grams of sample be mixed with 30 milliliters of distilled water for 30 seconds. The probe is then inserted for 30 seconds and a reading is taking using a digital pH meter.

Each of the five samples was examined under a 10X and 15X stereoscope to determine clast size, sorting, lithologies, and shrink-swell capacity. Where appropriate, sphericity and roundness were also estimated. Methodology followed Folk (1980) and the Kent State University grain analysis chart was used to standardize comparisons. Shrink-swell potentials were determined by observing the effect of distilled water on dry soil aggradations.

The Bouyoucos (1962) Hydrometer Method for particle size analysis was employed to determine the percentages of sand, coarse silt, fine silt and clay in five samples. Organics were oxidized with 30% hydrogen peroxide and carbonates were withdrawn using a distilled water rinse. The soil textures were plotted on the Soil Conservation Service (1966) textural triangle and geologic textures were plotted on the textural class triangle of Shepard (1954).

Analytical Techniques for Pollen Studies:

Five pollen samples were collected from four strata at the Travis 2 site. These samples were processed by Linda Scott Cummings with PaleoResearch Laboratories of Lakewood, Colorado. A chemical extraction technique based on flotation is the standard preparation technique used in this laboratory for the removal of the pollen from the large volume of sand, silt and clay with which they are mixed. This particular process was developed for extraction of pollen from soils where preservation has been less than ideal and pollen density is low.

Hydrochloric acid (10%) was used to remove calcium carbonates present in the soil, after which the samples were screened through 150 micron mesh. Zinc bromide (density 2.0) was used for the flotation process. All samples received a short (10 minute) treatment in hot hydrofluoric acid to remove any remaining inorganic particles. The samples were then acetolated for three minutes to remove any extraneous organic matter.

A light microscope was used to count the pollen to a total of 100 to 200 pollen grains at a magnification of 430 power. Pollen preservation in these samples varied from fair to poor. Comparative reference material collected at the Intermountain Herbarium at Utah State University and the University of Colorado Herbarium was used to identify the pollen to the family, genus, and species level, where possible.

Pollen aggregates were recorded during identification of the pollen. Aggregates are clumps of a single type of pollen and may be interpreted to represent pollen dispersal over short distances or the actual introduction of portions of the plant represented into an archeological setting. Aggregates were included in the pollen counts as single grains, as is customary.

Analytical Techniques for Opal Phytolith Studies:

Opal phytoliths are minute silica bodies which form in plants during the maturation process (Hannus 1986:79). Five samples from the Travis 2 site were processed for opal phytoliths by Susan C. Mulhollan and George

Rapp, Jr. with the Archaeometry Laboratory, University of Minnesota-Duluth. The objectives of this study were twofold. First, the abundance and degree of preservation of phytoliths within the samples were assessed. Second, 200 identifiable phytoliths were classified in each sample containing sufficient material. Classification is to phytolith type rather than plant taxa, as is done in pollen studies. At this stage of research, only some phytolith types can be confidently assigned to a plant taxon.

The sediment extraction procedure employed follows the methods outlined in Mulholland and Rau (1985). Separation is based on both particle size and specific gravity. Sand (larger than 88 micrometers) is removed by sieving; clay (smaller than 5 to 10 micrometers) is removed by settling. Particles with a specific gravity between 2.3 and 1.5 are then extracted with a heavy liquid solution of zinc bromide, hydrochloric acid, and water. To increase phytolith recovery, the extraction step is repeated twice. Five sediment fractions are separated by this procedure: sand, clay, heavy, light, and phytolith. All are rinsed and checked for phytoliths.

Slides for light microscopic examination were prepared with Permount (index of refraction 1.54). Each fraction was examined with a Zeiss Universal petrographic microscope equipped with a Nomarski Differential Interference Contrast (DIC) condenser system. The Nomarski DIC increases contrast in transparent particles, including phytoliths, by introducing a shadow effect.

The classification scheme utilized is based on the type of cell that becomes silicified (Mulholland 1987; Mulholland and Rapp 1985):

- 1) Trichomes Hairs and papillae. Spherical to ovoid base with a conical top.
- 2) Stomata Guard and/or subsidiary cells. The entire complex is ovoid in shape. Guard cells are shaped like a telephone receiver. Subsidiary cells are ovoid to trianguloid.
- 3) Bulliform cells Enlarged thin-walled epidermal cells. Keystone shapes.
- 4) Epidermal groundmass cells Unspecialized epidermal cells. Various rectangular box shapes with interlocking edges. Thin.
- 5) Rods Fibers, schlereids, xylem cells and other cylindrical shaped cells.
- 6) Rectangles /Squares Large blocky cells. Cube to rectangular box. Thicker than groundmass cells or silica-bodies.
- 7) Silica-bodies Phytoliths from specialized silica accumulating cells. Truncated to beveled pyramids, cones, rectangular boxes, and cylinders. At least one broad face (base) is present. Note that although silica-bodies are equated with short cells in botanical texts, some very

long bodies are included here with the shorter ones. The long bodies are consistently silicified and resemble the other silica-bodies in surface texture (unlike groundmass cells that happen to be silicified). For these reasons, the longer cells are included here.

Categories 1 through 6 are not always silicified in grasses. Category 7 is consistently silicified (in fact, this is one identifying characteristic). Most of these categories cannot be assigned to a specific plant taxon. Category 7, however, is definitely an indicator of grasses. Grasses contain specialized silica-cells that function to collect silica (Esau 1977:85), as well as other anatomical elements that may become silicified. Every grass species examined has phytoliths from grass silica cells; no other plant taxon produces phytoliths with these shapes. The distinctive silica-bodies have been the subject of much taxonomic research (Metcalf 1960; Twiss, Suess and Smith 1969; Brown 1984). General shape subdivisions used in this study are listed in Table 6.1.

Silica-bodies exhibit both multiplicity and redundancy (Rovner 1971). Multiplicity is the production of many shapes by a taxon; redundancy is the identification of plants by phytoliths. Specifically, occurrence of a particular phytolith type in a sediment usually does not identify a specific plant taxon. However, ratios of phytolith types can indicate dominant plant contributors.

Based on reference material from central North Dakota, some identifications can be made (Mulholland 1987). Grass silica bodies are identified to Gramineae subfamilies and tribes as follows. Saddles (Figure 6.1a) indicate Chloridoideae, although they also occur in the Arundinoideae and Pooideae. Sinuous shapes and rectangles (Figure 6.1b) indicate the tribes Pooeae, Triticeae, Aveneae, and Phalarideae of the Pooideae. Dumbbells (Figure 6.1c) are produced by the Panicoideae, Aristideae (Arundinoideae), Chloridoideae, and Stipeae (Pooideae). Some preliminary distinctions may be made between these taxa. Stipeae tend to produce plateau-top dumbbells; saddle-top dumbbells are characteristic of the Chloridoideae. The Aristideae produce large quantities of dumbbells with long shafts. In the absence of these special types, dumbbells may be taken to indicate the Panicoideae. Rondels (Figure 6.1d) are found in most of the subfamilies, particularly from inflorescence material. Although most abundant in the Pooideae, rondels cannot be used as indicators of these taxa.

Other phytolith types are generally not as well identified to plant taxa. Silicified bulliform cells are considered indicative of the Gramineae. The other phytolith types may be produced by both grasses and other plant taxa (forbs, shrubs, and trees). Subdivisions of these types need to be worked out. Trichomes in particular are silicified in a wide variety of taxa and exhibit considerable morphological variation.

Analytical Techniques for Gastropod Studies:

Five bulk matrix samples of two liters compact volume were submitted to Larry Grantham, Missouri Department of Natural Resources, for gastropod analysis. Samples were taken in alternate 10 cm levels from the west

Table 6.1. Major shape types of grass silica-bodies (Mulholland 1987).

I. Body is a rectangular box to truncated or beveled pyramid; cross section of base approximately rectangular to square or other polygon (base may have lobes but general outline is a polygon); top is a flat to slightly concave or convex face or elevated ridges(s).	
	<u>Shape type</u>
A. Nonlobate: sides of base lack definite lobes	
1. Base has 3 sides	TRIANGLE
2. Base has 4 sides	RECTANGLE
3. Base has 5 sides	PENTAGON
B. Lobate: sides of base have definite lobes	
1. Minimal diameters of base approx. equal	CROSS
2. Minimal diameters of base unequal	
a. Bilobate: Maximum of 2 lobes per side	
1. Shaft/lobe ratio greater than 2/3	SINUOUS
2. Shaft/lobe ratio less than 2/3	DUMBELL
b. Polylobate: More than 2 lobes per side	
1. Shaft/lobe ratio greater than 2/3	SINUOUS
2. Shaft/lobe ratio less than 2/3	DUMBELL
II. Body is a short cylinder to truncated or beveled cone; cross section of base approximately oval to circular or other curved shape (base may have concave or flat segments but general outline is curved shape); top is a flat to slightly concave or convex face or elevated ridge(s).	
A. Entire: edges of base all convex	RONDEL
B. Flattened: some edges of base straight	RONDEL
C. Indented: some edges of base concave	RONDEL
III. Body is saddle-like; cross section of top or both top and base has two opposite convex edges that flare outward from the face surface and two opposite lower edges that are usually concave; top is concave.	
A. Tabular: top and base same shape and size	SADDLE
B. Plateau: top smaller than or diff. shape	SADDLE
C. Ridge: top is a ridge	SADDLE

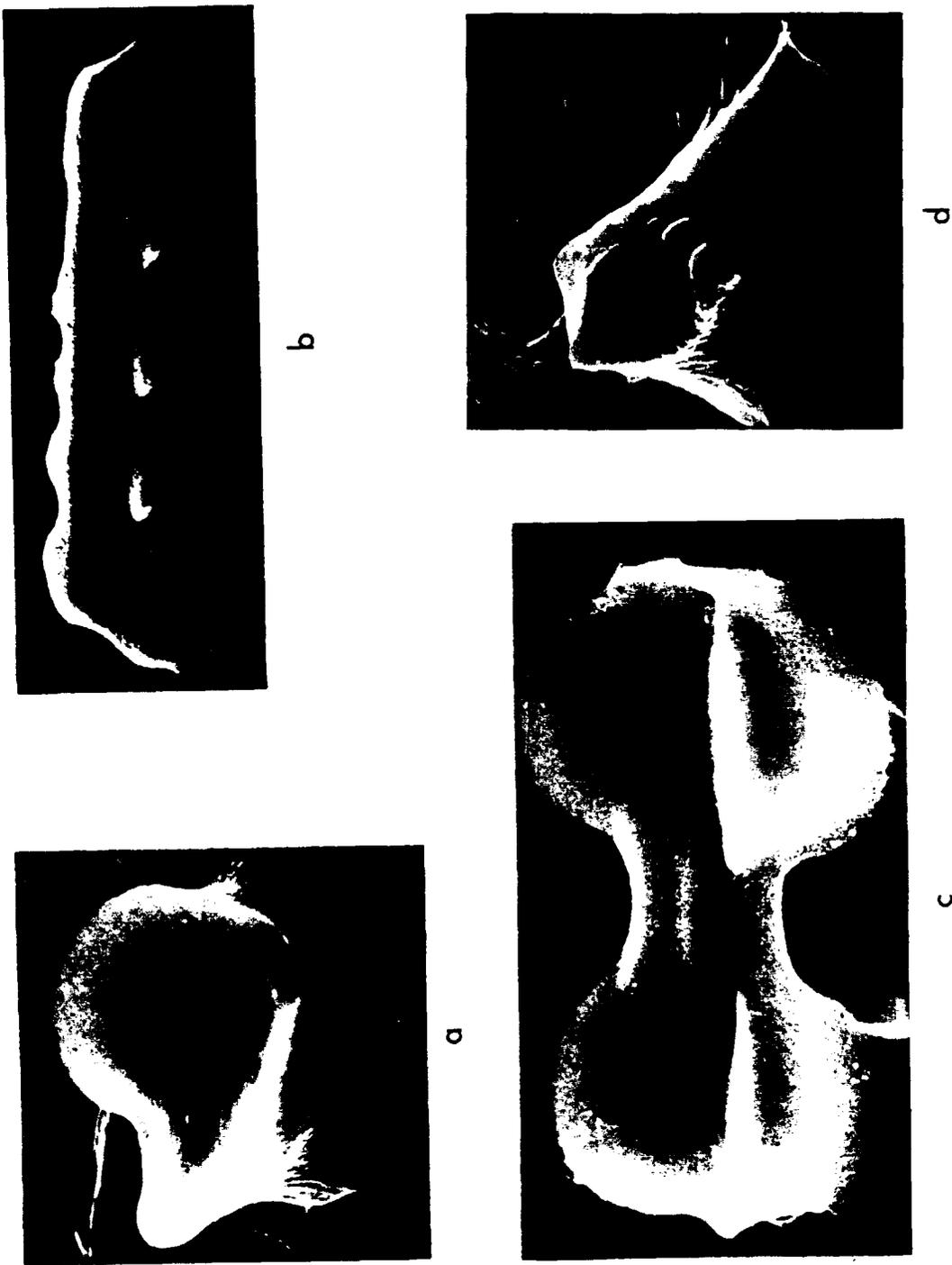


Figure 6.1. Scanning electron micrographs of four phytolith shape types; saddle (a; 5100x), sinuous rectangle (b; 2000x), dumbbell (c; 5000x), and rondel (d; 5000x).

profile of 24-26 m S/69-70 m W.

Due to their low clay content, samples 1 through 3 were soaked and then processed. Samples 4 and 5 were soaked overnight in water and detergent in order to help break down the clay. The samples were then washed in a No. 60 U.S. Standard Sieve Series (.250 mm) screen. The remaining residue was air dried for two to seven days. Sorting of the washed and dried matrix was done macroscopically. The sorting was performed on a dark background using a fine brush to examine a small amount of matrix at a time. This technique serves to visually isolate a small area of matrix, maximizes interparticle space and aids in the recovery not only of complete individuals but eggs and small fragments as well. This sorting process was repeated at least twice in order to assure maximum recovery.

CHAPTER SEVEN RESULTS OF INVESTIGATIONS

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Introduction

Figure 7.1 is a map of the Travis 2 site. This map illustrates the locations of past excavations as well as those conducted in 1987. Information is also provided to illustrate the two grid systems (the University of North Dakota's and Larson-Tibesar Associates') and their relationship to one another. In the headings which start the discussions of individual excavation units, the 1987 coordinates for the unit are listed first and these are the primary designations used throughout the rest of this report. Following these coordinates, the equivalent proveniences within the University of North Dakota (UND) grid system are listed in parentheses. Chapter Six contains a complete discussion of the differences in, and reasons for, these two grid systems.

In the discussions of the excavation units which are presented below, the depths mentioned are in relation to the northwest corner of the unit. The elevations of these corners were later recorded in conjunction with site mapping activities. Color terms used in the descriptions of excavation units are from Munsell Color (1975).

Table 7.1 is a listing of all surface and subsurface artifacts recovered from the Travis 2 site during the 1987 field work. This table often contains more specific information about these items than is presented in text. Table 4.1 in Chapter Four contains additional information on the two projectile points recovered.

Surface Collection

The surface reconnaissance of the site area resulted in the recovery of two projectile points and two bone fragments. As discussed in Chapter Four, the two projectile points (see Figure 4.1 in Chapter Four) are believed to be associated with the Late Prehistoric and Late Paleoindian occupations at the site. Both projectile points were found along the waterline in the western portion of the site as shown in Figure 7.1. The bone fragments were also located in this area of the site. The only identifiable bone is the fragment of the proximal portion of a Bison or Bos sp. metapodial.

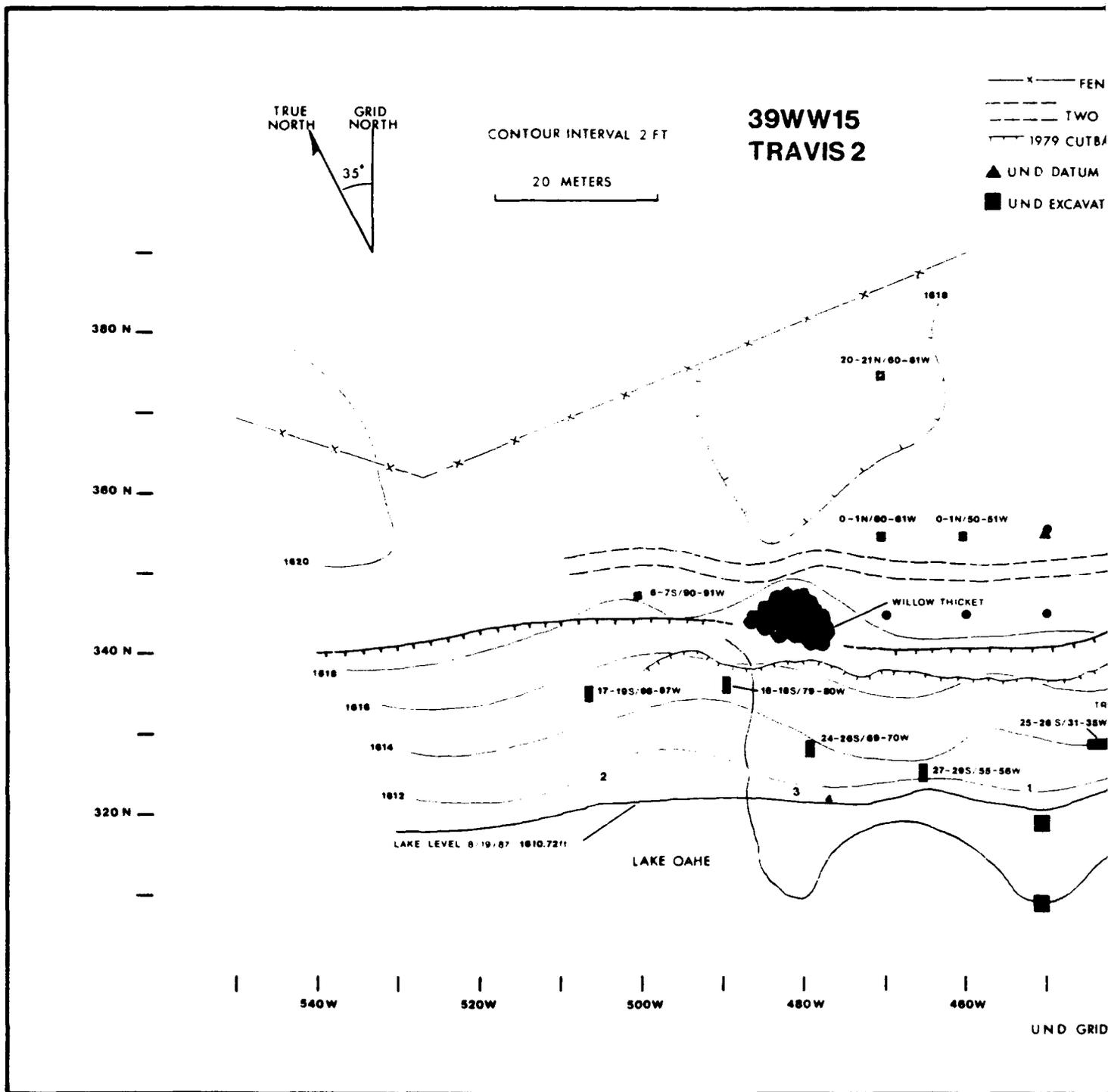


Figure 7.1. Map of the Travis 2 site, 39WW15.

10F2

Table 7.1. List of collected material.

COLLECTION UNIT	CAT NO.	DESCRIPTION	DEPTH	WEIGHT(g)	SIZE GRADE	PATINATION	
						DORSAL	VENTRAL
E.U.7-8S/27-28W	1	Gray Chalcedony Secondary Flake	10-20cm	0.05	3	H*	N
E.U.7-8S/27-28W	1	Brown Chalcedony Secondary Flake	10-20cm	0.05	4	N	SL
E.U.7-8S/27-28W	1	Gray Chert Secondary Flake (Shatter)	10-20cm	0.20	3	N	N
E.U.6-7S/27-28W	2	Knife River Flint Shatter (NC)	40-50cm	0.10	4	NA	SL
E.U.6-7S/27-28W	3	Large Mammal Long Bone Fragment Thick Carbonate Covering	40-50cm	1.85	2	--	--
E.U.16-17S/79-80W	4	Knife River Flint Shatter (NC)	20-30cm	0.10	3	SL	N
E.U.16-17S/79-80W	5	Rodent Incisor	10-20cm	0.15	4	--	--
E.U.17-18S/79-80W	6	Large Mammal Tooth Enamel	0-10cm	0.45	3	--	--
E.U.20-21N/60-61W	7	knife River Flint Tertiary Flake	0-10cm	0.05	4	N	N
E.U.20-21N/60-61W	7	Knife River Flint Tertiary Flake	0-10cm	0.30	3	SL	SL
E.U.20-21N/60-61W	7	Knife River Flint Secondary Flake (Shatter)	0-10cm	0.40	3	SL	SL
E.U.25-26S/32-33W	8	Knife River Flint Secondary Flake	10-20cm	2.20	3	M	M
E.U.25-26S/32-33W	9	Knife River Flint Core	20-30cm	25.65	1	M	NA
E.U.25-26S/32-33W	10	Knife River Flint Secondary Flake	20-30cm	1.95	2	N	N
E.U.25-26S/32-33W	10	Knife River Flint Secondary Flake	20-30cm	0.75	3	SL	N
E.U.25-26S/32-33W	11	Chert Biface Fragment	30-40cm	40.10	1	NA	NA
E.U.25-26S/32-33W	12	Knife River Flint Secondary Flake	30-40cm	1.20	3	H	SL
E.U.25-26S/32-33W	12	Knife River Flint Tertiary Flake	30-40cm	0.15	3	H	H
E.U.25-26S/32-33W	12	Knife River Flint Tertiary Flake	30-40cm	0.15	3	M	M
E.U.25-26S/32-33W	12	White Chert Secondary Flake (Shatter)	30-40cm	0.95	3	NA	NA
E.U.25-26S/32-33W	12	Gray Tongue River Silicified Sediment Secondary Flake	30-40cm	0.30	3	NA	NA
E.U.25-26S/32-33W	12	Burnt Gray Chert Spall	30-40cm	1.20	3	NA	NA
E.U.25-26S/32-33W	12	Brown Chalcedony Secondary Flake	30-40cm	1.15	3	M	SL
E.U.25-26S/32-33W	12	Gray Tongue River Silicified Sediment Secondary Flake	30-40cm	28.20	1	NA	NA
E.U.25-26S/32-33W	12	White Chert Primary Flake	30-40cm	0.20	4	NA	NA

Table 7.1. Continued.

<u>COLLECTION UNIT</u>	<u>CAT NO.</u>	<u>DESCRIPTION</u>	<u>DEPTH</u>	<u>WEIGHT(g)</u>	<u>SIZE GRADE</u>	<u>PATINATION</u>	
						<u>DORSAL</u>	<u>VENTRAL</u>
E.U.25-26S/32-33W	13	Knife River Flint Primary Flake (Shatter)	0-20cm	1.55	3	NA	SL
E.U.25-26S/32-33W	14	White Chert Secondary Flake	0-10cm	0.60	3	NA	NA
E.U.25-26S/32-33W	15	Two Bone Fragments (One Burnt)	30-40cm	0.15	4	NA	NA
E.U.25-26S/31-32W	16	Pink Quartzite Tertiary Flake	30-40cm	0.05	4	NA	NA
E.U.25-26S/31-32W	16	Brown Chalcedony Tertiary Flake	30-40cm	0.15	3	SL	H
E.U.25-26S/33-34W	17	Brown Petrified Wood Shatter	30-40cm	1.70	2	NA	NA
E.U.25-26S/33-34W	17	Brown Chalcedony Shatter	30-40cm	0.05	4	H	H
E.U.25-26S/33-34W	18	Red Tongue River Silicified Sediment					
		Secondary Flake	40-50cm	13.25	2	NA	NA
E.U.25-26S/33-34W	18	Knife River Flint Tertiary Flake	40-50cm	0.05	4	SL	SL
E.U.25-26S/34-35W	19	Knife River Flint Tertiary Flake	30-40cm	0.10	4	SL	SL
E.U.25-26S/34-35W	19	Tan Chert Tertiary Flake	30-40cm	0.35	3	NA	NA
E.U.25-26S/34-35W	20	One Bone Fragment	30-40cm	0.05	4	--	--
E.U.25-26S/34-35W	42	Knife River Flint Secondary Flake	40-50cm	1.50	3	SL	N
E.U.25-26S/34-35W	42	Brown Chalcedony Burnt Shatter	40-50cm	2.00	2	NA	NA
E.U.6-7S/90-91W	21	Gray Tongue River Silicified Sediment					
		Fragment (NC)	20-30cm	113.25	1	NA	NA
E.U.6-7S/90-91W	22	Brown Chalcedony Fragment (NC)	63cm	4.50	2	H	H
E.U.27-28S/55-56W	23	Red Tongue River Silicified Sediment					
		Shatter	10-20cm	6.35	2	NA	NA
E.U.27-28S/55-56W	23	Gray Tongue River Silicified Sediment					
		Secondary Flake	10-20cm	8.85	2	NA	NA
E.U.27-28S/55-56W	23	Gray Tongue River Silicified Sediment					
		Secondary Flake	10-20cm	0.90	3	NA	NA
E.U.27-28S/55-56W	23	Gray Tongue River Silicified Sediment					
		Secondary Flake	10-20cm	2.60	2	NA	NA
E.U.24-25S/69-70W	24	One Mollusk Shell	20-30cm	NA	-	--	--
E.U.24-25S/69-70W	25	One Unidentifiable Bone Fragment					
		(Two pieces fit together)	40-50cm	6.25	2	--	--

Table 7.1. Continued.

<u>COLLECTION UNIT</u>	<u>CAT NO.</u>	<u>DESCRIPTION</u>	<u>DEPTH</u>	<u>WEIGHT(g)</u>	<u>SIZE GRADE</u>	<u>DORSAL</u>	<u>PATINATION VENTRAL</u>
E.U.24-25S/69-70W	26	One Burnt Unidentifiable Bone Fragment	60-70cm	0.15	3	--	--
E.U.24-25S/69-70W	27	3 Unidentifiable Bone Fragments	70-80cm	1.55 0.95(2)	2 3	--	--
E.U.24-25S/69-70W	28	Two Mollusk Shells	70-80cm	NA	-	--	--
E.U.25-26S/69-70W	29	Three Unidentifiable Bone Fragments	30-40cm	3.10 0.20(2)	2 3	--	--
E.U.25-26S/69-70W	30	Two Unidentifiable Bone Fragments	40-50cm	1.85(2)	2	--	--
E.U.25-26S/69-70W	31	Five Mollusk Shells	60-70cm	NA	-	--	--
E.U.25-26S/69-70W	32	One Unidentifiable Bone Fragment	60-70cm	1.45	2	--	--
Map Point 1	33	White Chalcedony Late Prehistoric Corner Notched Projectile Point	Surface	1.70	3	NA	NA
Map Point 2	34	Knife River Flint Late Paleoindian Projectile Point	Surface	5.65	2	M	N
Map Point 3	35	Four Unidentifiable Bone Fragments	Surface	1.15(2) 6.80(2)	3 2	--	--
Map Point 4	36	Proximal Metapodial Fragment (Bison?)	Surface	36.75	1	--	--
S.T.345N/360W	37	Eight Unidentifiable Bone Fragments	20-40cmBS	0.45	4	--	--
S.T.345N/360W	38	White Chalcedony Secondary Flake	60-80cmBS	0.35	3	N	M
S.T.345N/370W	39	Brown Chalcedony Secondary Flake	15-30cmBS	0.35	3	SL	H
S.T.345N/370W	40	Gray Chert Secondary Flake (Burnt)	50-75cmBS	0.25	3	NA	NA
S.T.355N/380W	41	Gray Chert Secondary Flake	30-40cmBS	0.30	3	NA	NA

* H - Heavy Patination (75-100 percent of original color obliterated)
M - Moderate Patination (25-75 percent of original color obliterated)
SL - Slight Patination (1-25 percent of original color obliterated)
N - No Patination
NA - Not Applicable
NC - Not Cultural

Excavation Unit Results

The following section details the excavation unit results. The units are discussed beginning with the northernmost units based on the Larson-Tibesar coordinate system. The first three units to be discussed occur on the north side of the vehicle trail. They were positioned to examine potential site extent in a northerly direction as well as determine the amount of disturbance in this area caused by gravel quarry operations. The remaining units were located either on the upper terrace areas south of the vehicle trail or on the beach area.

Excavation Unit 20-21 m N/60-61 m W (UND 375-376 m N/470-471 m W):

This unit is located north of the vehicle trail in a low depression as shown in Figure 7.1. The upper 25 cm consist of a very dark brown silt loam (Figure 7.2). A one to two centimeter thick charcoal layer separates this upper stratum (3) from the dark brown sandy clay loam situated below it. Stratum 2 extends to approximately 80 cm (Figure 7.3a). The lowest stratum (1) consists of a very dark gray sandy clay loam extending to at least 100 cm. Scattered gravels occur throughout the profile (see Figure 7.3a).

The first 10 cm of this unit contained three Knife River flint flakes which are the only prehistoric materials found within the unit (see Table 7.1). The only other cultural remains found in the unit consist of a few scraps of fairly recent historic trash from between 60 and 80 cm.

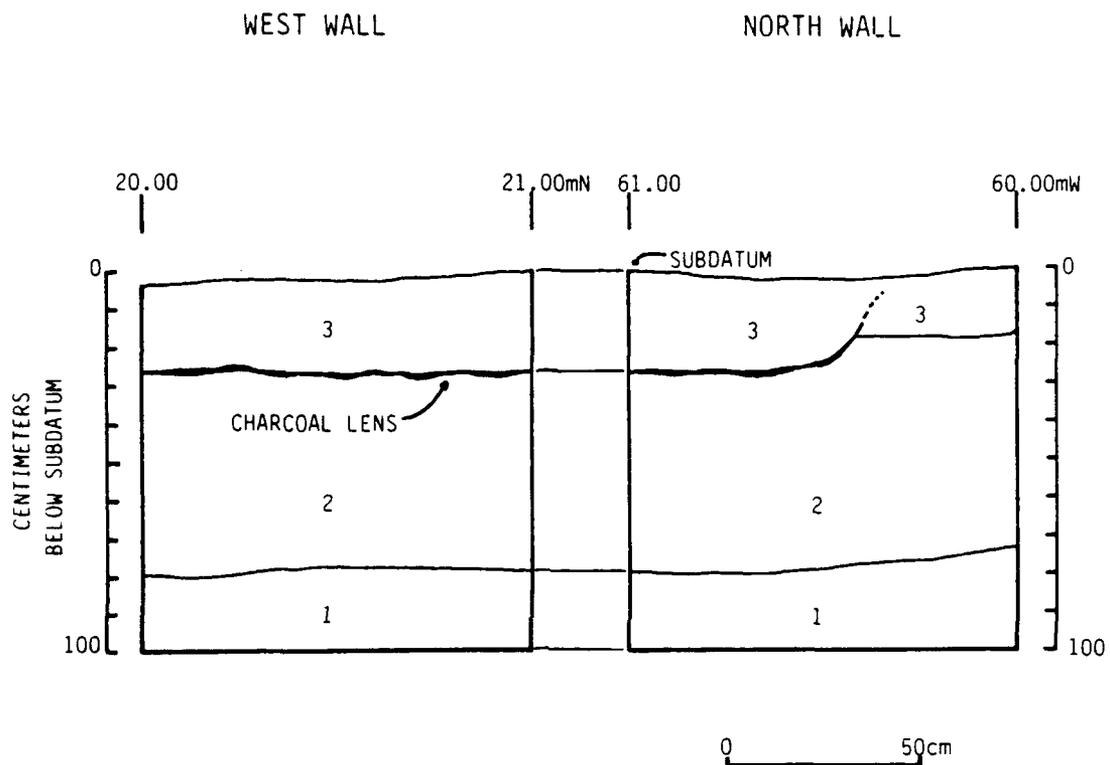
It is evident from the scattered gravels, charcoal lens, and deeply buried historic trash that this entire unit represents the recent filling of the abandoned gravel quarry (see Chapter Two). The charcoal lens was also found in Backhoe Trench 2, which is discussed later in this chapter. It is thought to represent a surface burn which was subsequently buried with other fill materials. This upper layer of fill may have been originally scraped from the surface of the site as it does contain a few scattered prehistoric artifacts.

Excavation Unit 0-1 m N/50-51 m W (UND 355-356 m N/450-451 m W):

The following two units to be discussed are located adjacent to the vehicle trail (see Figure 7.1). The first of the units was excavated to approximately 100 cm and consists almost entirely of a highly mixed or mottled (up to 10 cm in diameter), very dark grayish brown, silt loam with numerous gravels (Figures 7.3b and 7.4). No cultural materials were recovered. Due to the highly mottled appearance and the presence of poorly sorted and scattered gravels, this unit is also thought to represent gravel quarry fill.

Excavation Unit 0-1 m N/60-61 m W (UND 355-356 m N/470-471 m W):

This unit consists of approximately ten centimeters of a light brownish gray loamy sand on top of at least one meter of sands and gravels (Figures 7.5 and 7.6a). No cultural materials were recovered from



3 - VERY DARK BROWN SILT LOAM, VERY SLIGHT CaCO_3 REACTION, WITH GRAVELS

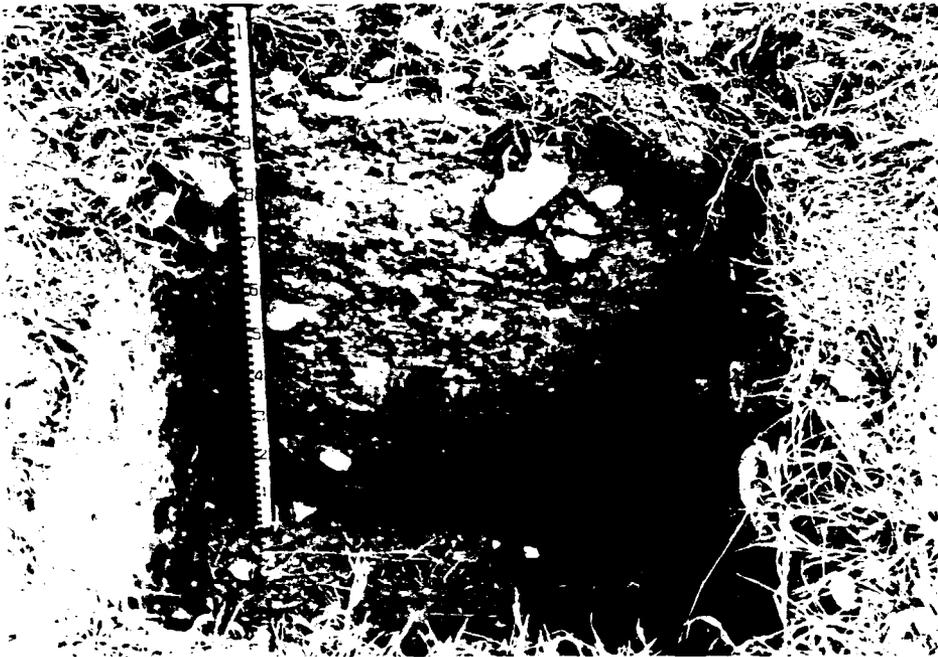
2 - DARK BROWN SANDY CLAY LOAM WITH SOME GRAVELS, SLIGHT CaCO_3 REACTION

1 - VERY DARK GRAY SANDY CLAY LOAM, VERY SLIGHT CaCO_3 REACTION, SOME GRAVELS PRESENT

Figure 7.2. Profile of Excavation Unit 20-21 m N/60-61 m W.



a



b

Figure 7.3. North wall of Excavation Unit 20-21 m N/60-61 m W (a) and north wall of Excavation Unit 0-1 m N/50-51 m W (b).

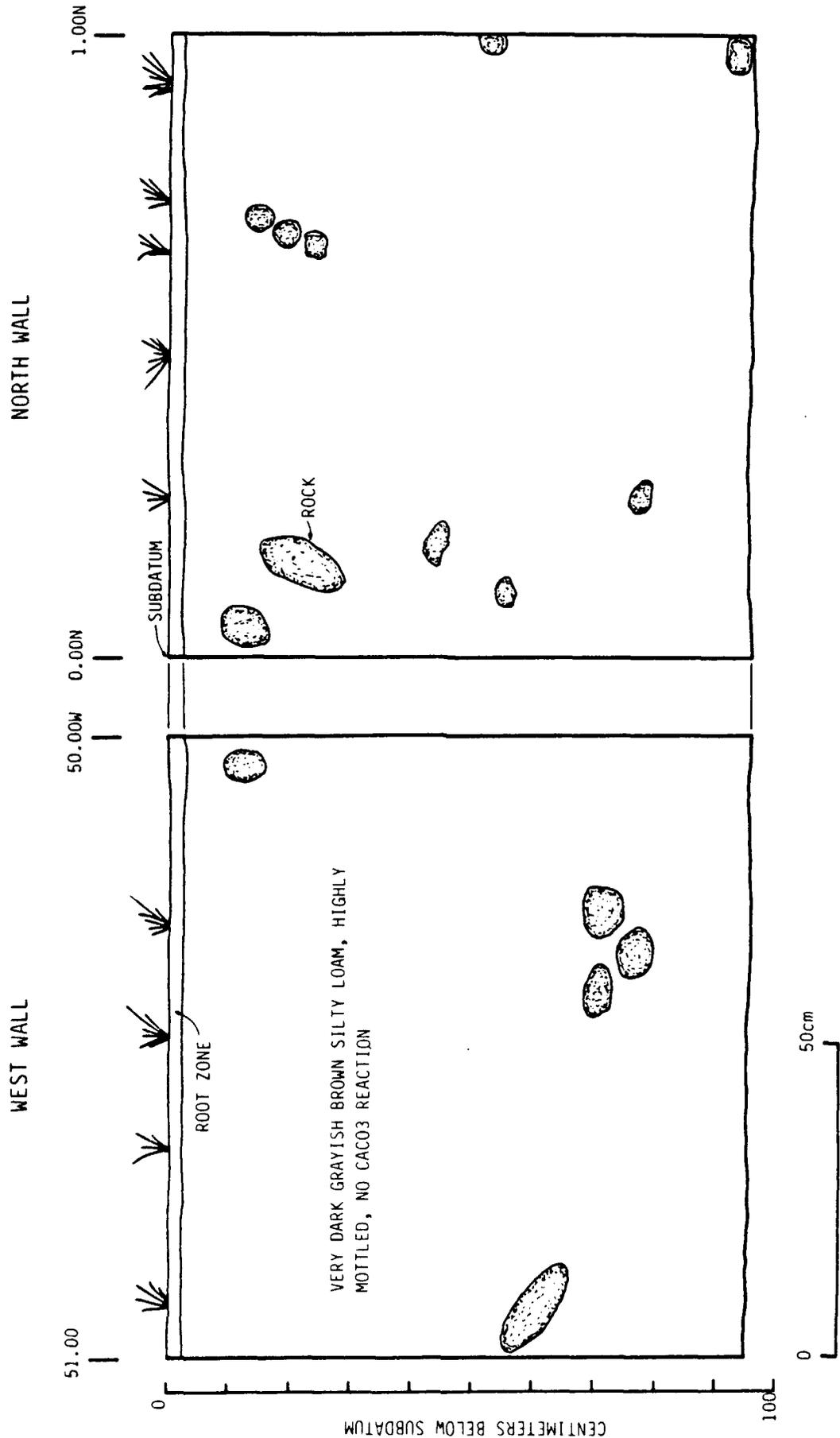


Figure 7.4. Profile of Excavation Unit 0-1 m N/50-51 m W.

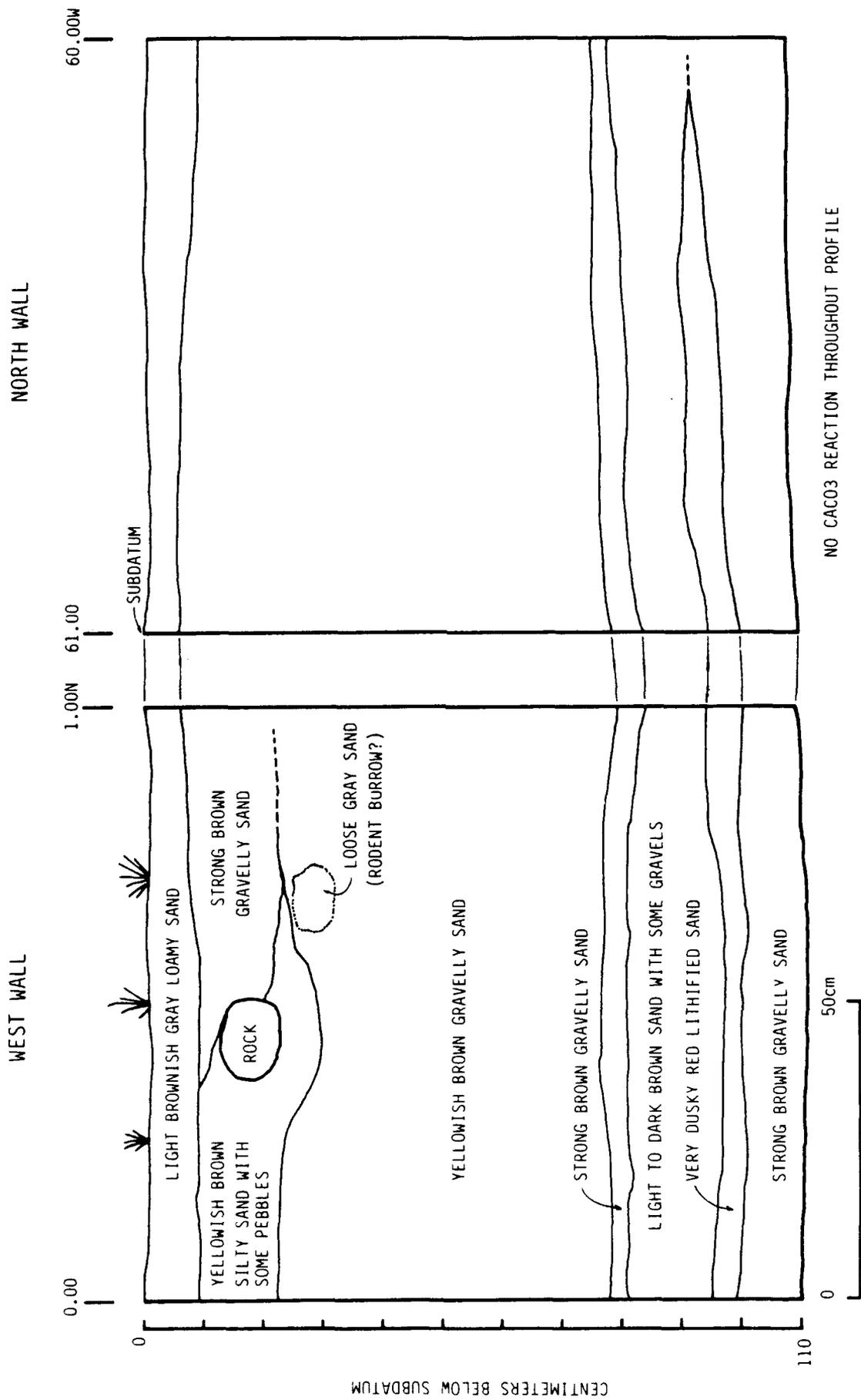
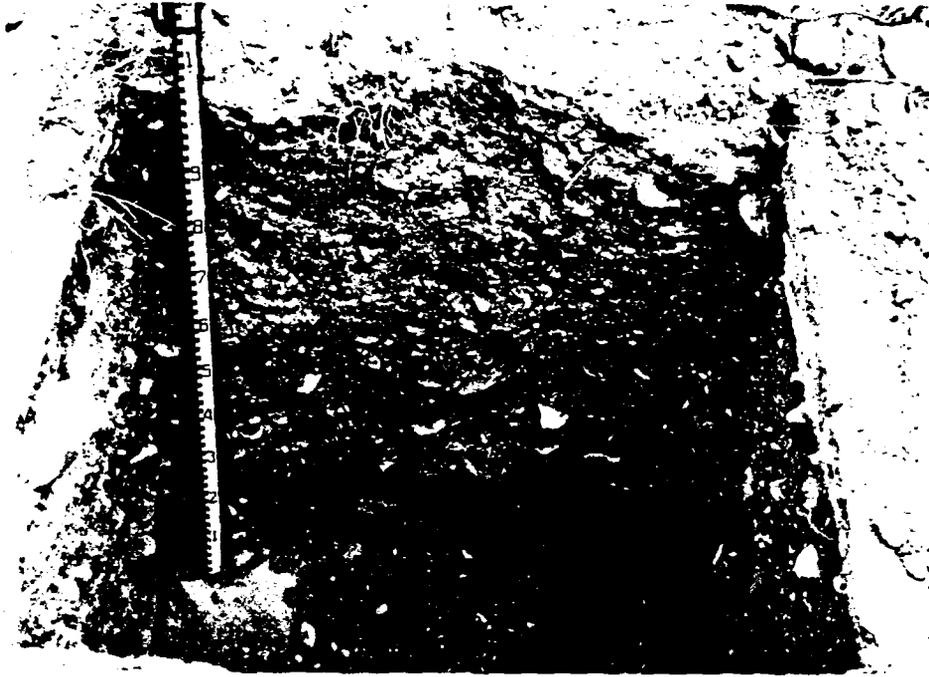


Figure 7.5. Profile of Excavation Unit 0-1 m N/60-61 m W.



a



b

Figure 7.6. North wall of Excavation Unit 0-1 m N/60-61 m W (a) and west wall of Excavation Unit 6-8 m S/27-28 m W (b).

Excavation Unit 0-1 m N/60-61 m W. In contrast to the previous units, with the exception of the upper 10 cm of disturbed matrix, the sands and gravels within this unit are comprised of intact layers with distinct boundaries and coloration which are believed to be equivalent to Ahler et al.'s (1977) Unit C gravels. Based on the intact stratigraphy, it is apparent that this particular area was not quarried and refilled such as were the previous two excavation units.

Excavation Unit 6-8 m S/27-28 m W (UND 348-349 m N/437-438 m W):

This unit was placed adjacent to the northern end of Backhoe Trench 1 (see Figure 7.1). This particular area, from the cutbank to the vehicle trail, contains at least 50 cm of undisturbed compact silts above the gravel layers exposed in the backhoe trench. It was decided to place an excavation unit in this area in order to determine if any cultural materials were present in these silts on the upper terrace. The profile for this unit is illustrated within the Backhoe Trench 1 profile discussed later in this chapter.

The first 25 cm consist of a very dark grayish brown clayey silt with platy structure (Figure 7.6b). A dark brown loamy silt occurs from approximately 25 to 35 cm in the southern half of the unit and eventually pinches out in the northern half. Under this stratum is a light olive brown clayey silt with subangular blocky soil structure which extends from 20 to 30 cm below the surface in the northern half to 35 to 65 cm below the surface in the southern half of the unit.

The next stratum consists of a 35 to 40 centimeter thick layer of massive, dark grayish brown, gravelly clayey silt. This latter layer does not correspond to any of the stratigraphic units described by Ahler et al. (1977). The gravels in the unit are scattered and poorly sorted and occur within a matrix of clayey silt. The combination of these two sediments are similar to the gravel quarry fill found in the previously described units and would initially suggest a disturbed context, if sediments exhibiting some soil structure did not occur above it. The characteristics also suggest an outwash origin for the sediments which were deposited on top of the intact Unit C alluvial gravels. The stratigraphic position of this unit within the Backhoe Trench 1 (see below) suggests that it was deposited prior to the Unit C "gray clays." It is possible that this stratum represents a poorly sorted channel deposit similar to but earlier than the Unit B deposit described by Ahler et al. (1977). It therefore appears that this layer can be considered another variant of Ahler et al.'s (1977) Unit C.

Three flakes were recovered from 10 to 20 cm. In addition, one piece of Knife River flint and a large mammal bone were recovered from 40 to 50 cm. This latter zone is the contact of the brown clayey silt and the gravelly clayey silt (see Table 7.1). Neither piece has distinguishing characteristics and they are considered non-cultural.

Excavation Unit 6-7 m S/90-91 m W (UND 348-349 m N/500-501 m W):

The next three units to be discussed are located along the western edge of the site, to the west of the willow thicket (see Figure 7.1). Excavation Unit 6-7 m S/90-91 m W contained approximately 70 centimeters of a light brownish gray silt loam with scattered, poorly sorted, gravels (Figure 7.7 and 7.8a). This stratum overlies an intact gravelly sand, similar to that found in Excavation Unit 0-1 m N/60-61 m W and the lower level of Backhoe Trench 1. The angled boundary of the two strata and the poorly sorted gray silt loam suggest that the upper stratum is the result of gravel quarry fill.

Two pieces of flakeable lithic material were recovered from the unit (see Table 7.1). Neither piece has any distinctive cultural characteristics and, given the context, both are considered non-cultural.

Excavation Unit 16-18 m S/79-80 m W (UND 337-339 m N/489-490 m W):

This unit is located to the south of Excavation Unit 6-7 m S/90-91 m W but still west of the willow thicket (see Figure 7.1). A surface layer of loose sand and gravel was removed prior to the excavation of this unit. The first 10 to 15 cm (Stratum 4) consist of a brown to dark brown clayey sand (Figures 7.8b and 7.9). The next stratum (3) consists of a dark grayish brown sandy clay loam grading to a silty clay near the bottom. This stratum extends to approximately 45 to 50 cm in the northern part of the unit and to 66 cm in the south.

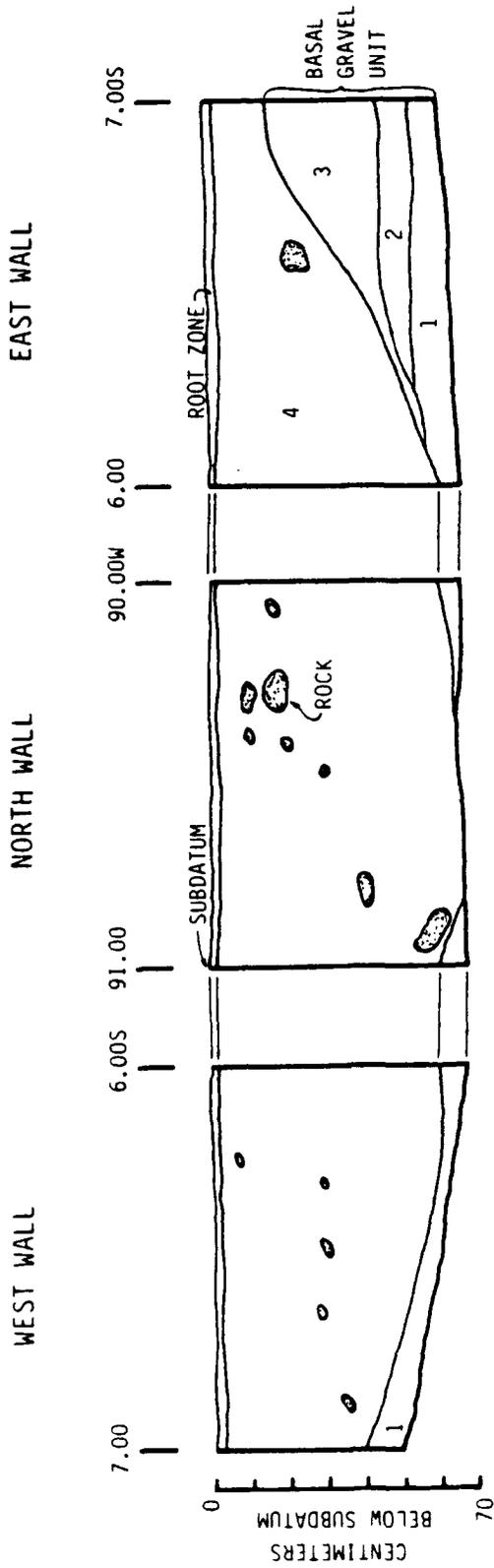
A black sandy clay loam underlies Stratum 3 in the northwestern corner of the unit. Initially it was believed that the black sandy clay loam could be a remnant of the paleosol described as occurring on top of Unit C by Ahler et al. (1977:30, 32) since it has a similar color and stratigraphic position. However, the lack of any soil structure indicates that the dark color of this stratum is the result of a high organic content and not an indicator of a true buried soil. The lowest stratum is Ahler et al.'s (1977) Unit C yellowish brown gravelly sand, encountered at approximately 45 to 50 cm in the northern half and at 66 cm in the southern half of the unit. There does not appear to be any evidence of a Unit B sand within this unit. The overlying sediments are equivalent to Ahler et al.'s Unit A. No cultural materials were recovered from this excavation unit.

Excavation Unit 17-19 m S/96-97 m W (UND 336-338 m N/506-507 m W):

This unit consisted entirely of Unit C sand and gravel layers (Figure 7.10a). It was excavated to 20 cm before excavation was halted. No cultural materials were recovered.

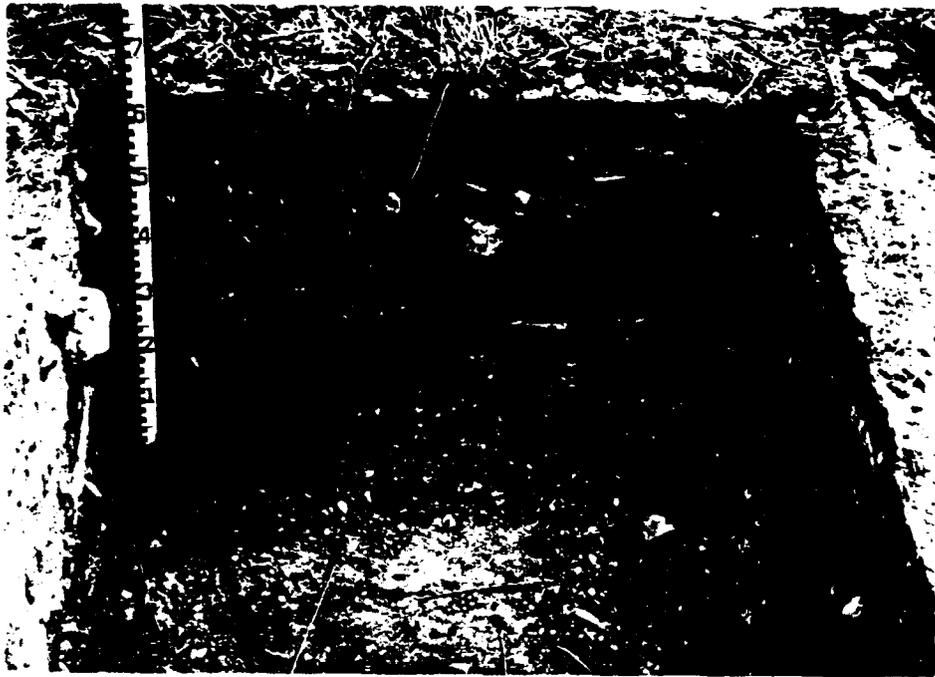
Excavation Unit 24-25 m S/28-30 m W (UND 330-331 m N/438-440 m W):

The last four excavation units to be discussed were positioned to the east and south of the willow thicket in areas where, based on previous studies, in situ cultural materials should be present (see Figure 7.1).



- 4 - LIGHT BROWNISH GRAY SILT LOAM WITH SOME GRAVELS, VERY SLIGHT CACO3 REACTION
- 3 - BROWN GRAVELLY SAND, SLIGHT CACO3 REACTION
- 2 - LIGHT GRAY GRAVELLY SAND, STRONG CACO3 REACTION (CARBONATE LENS)
- 1 - YELLOWISH BROWN GRAVELLY SAND, SLIGHT CACO3 REACTION

Figure 7.7. Profile of Excavation Unit 6-7 m S/90-91 m W.

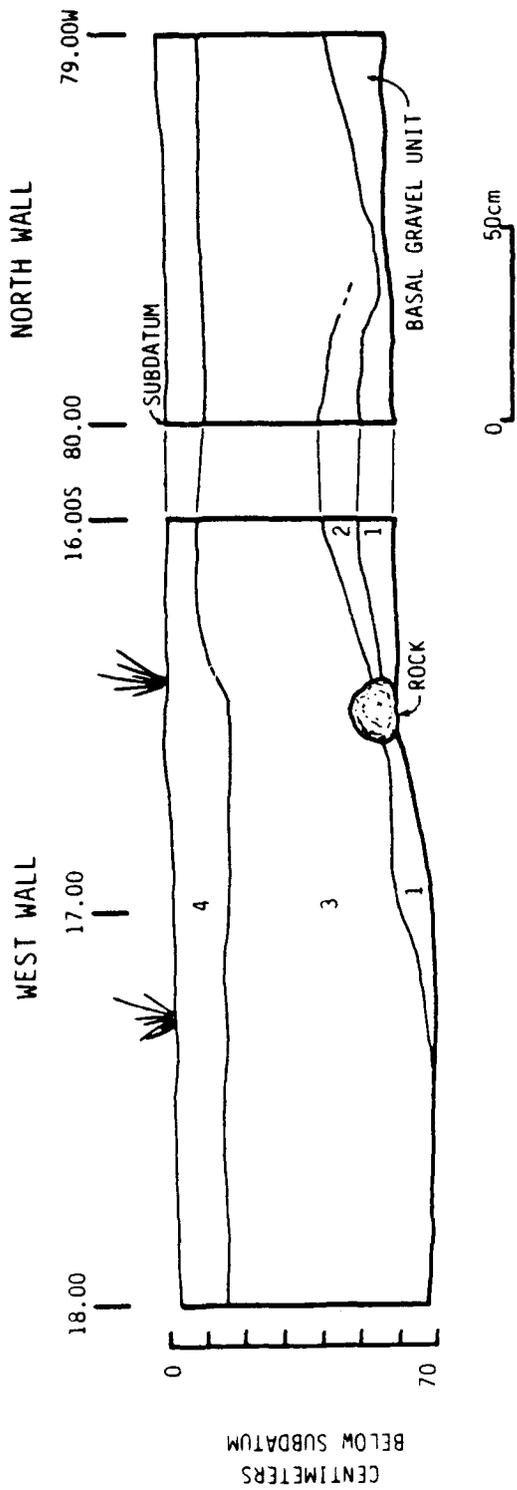


a



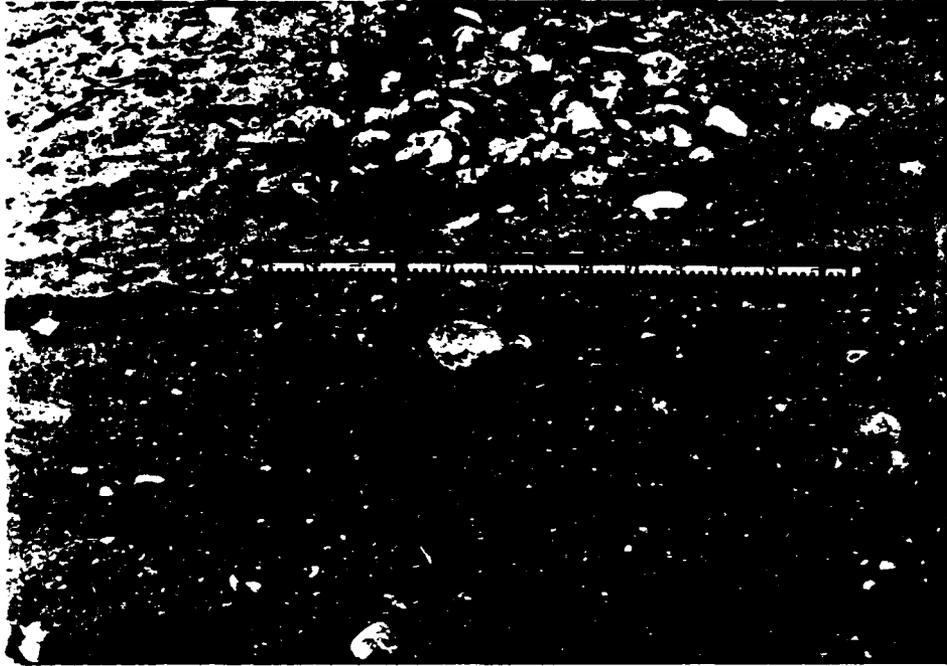
b

Figure 7.8. East wall of Excavation Unit 6-7 m S/90-91 m W (a) and north wall of Excavation Unit 16-18 m S/79-80 m W (b).

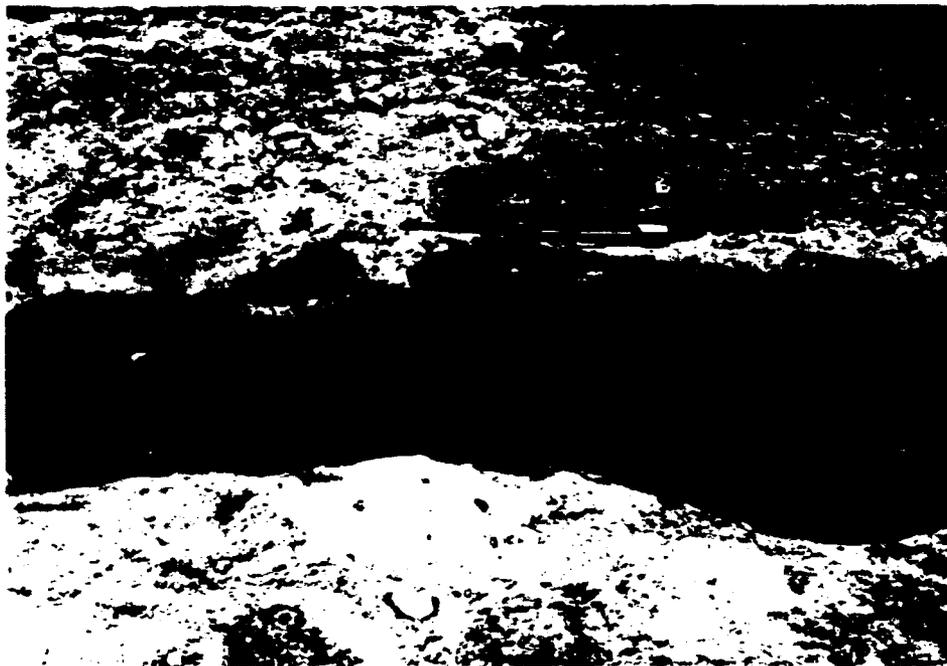


- 4 - BROWN/DARK BROWN CLAYEY SAND, VIOLENT CAC03 REACTION.
- 3 - DARK GRAYISH BROWN SANDY CLAY LOAM GRADING TO SILTY CLAY, VIOLENT CAC03 REACTION.
- 2 - BLACK SANDY CLAY LOAM, STRONG CAC03 REACTION.
- 1 - YELLOWISH BROWN GRAVELLY SAND, SLIGHT CAC03 REACTION.

Figure 7.9. Profile of Excavation Unit 16-18 m S/79-80 m W.



a



b

Figure 7.10. West wall of Excavation Unit 17-19 m S/96-97 m W (a) and north wall of Excavation Unit 24-25 m S/28-30 m W (b).

Excavation Unit 24-25 m S/28-30 m W was found to contain an initial stratum of very dark grayish brown silty clay loam which extends to approximately 20 cm (Figures 7.10b and 7.11) and has characteristics similar to Ahler et al.'s (1977) Unit A. Below this is a reddish brown sandy clay (probable Unit B) extending between 30 and 45 cm. The bottom of the excavation unit is a Unit C grayish brown clay loam with carbonate concretions described by Ahler et al. (1977:30) as carbonate cemented "crumbs." No cultural materials were recovered.

Excavation Unit 25-26 m S/31-35 m W (UND 329-330 m N/441-445 m W):

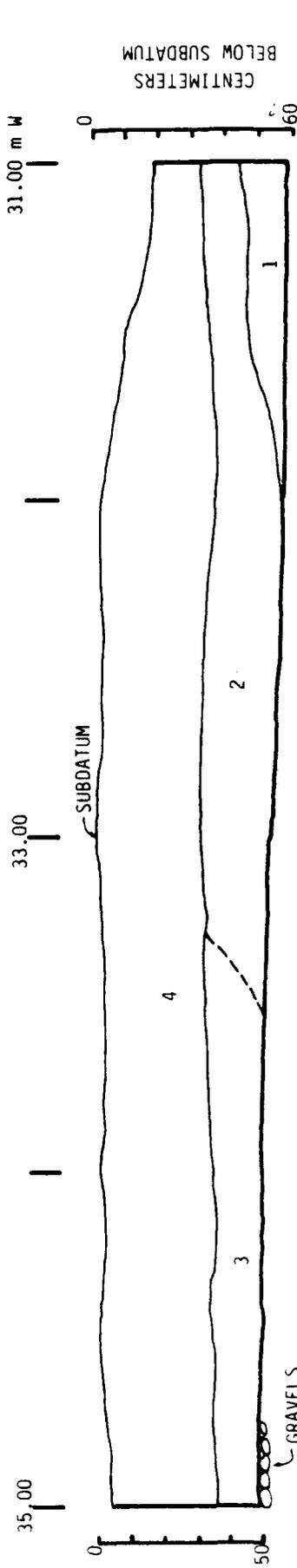
This unit was originally one-by-two meters in size. Due to the relatively large amount of recovered cultural materials, the excavation was expanded into a one-by-four meter unit (see Figure 7.1). The first 30 to 35 cm (Stratum 4) consists of a very dark brown silty clay loam (Figures 7.12 and 7.13) and is a continuation of the uppermost stratum described for Excavation Unit 24-25 m S/28-30 m W. Stratum 4 thickens to the west and overlies two differing strata (2 and 3). In the eastern half of the excavation unit it overlies a reddish brown weak sandy loam (i.e., nearly sand) which grades into a very dark grayish brown gravelly sandy clay (Stratum 3) at approximately 33.50 m W. Although these two strata have differing characteristics, based on their composition, both appear comparable to Ahler et al.'s (1977) Unit B. At approximately 50 to 55 cm a light brownish gray sandy clay (Unit C) occurs. This stratum (1) was mixed with gravels in the northwest corner of the unit.

Excavation Unit 25-26 m S/31-35 m W contained the majority of the cultural material recovered from excavation. These materials consist of flakes, a biface (Figure 7.14), a core, and several bone fragments (see Table 7.1). Most of the cultural material was recovered from the 30 to 40 cm level which corresponds to the contact of the probable Unit B sand (strata 2 and 3) with the overlying Unit A (Stratum 4) dark brown silty clay loam (see Table 7.1 and Figure 7.12). The stratigraphic position of the cultural materials is equivalent to the late Paleoindian "main archeological zone" described by Ahler et al. (1977:46-47). Within this level, most of the cultural materials occur in 25-26 m S/32-33 m W.

Excavation Unit 27-29 m S/55-56 m W (UND 326-328 m N/465-466 m W):

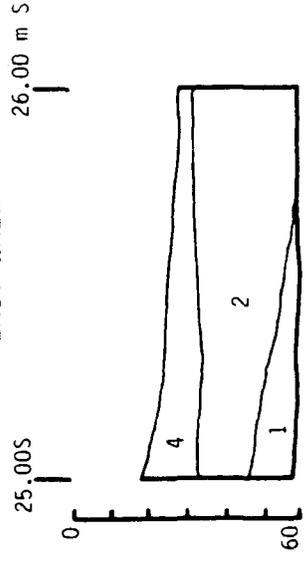
The strata within this unit slope to the south with the initial dark brown sandy clay extending to 5 cm along the north wall to 25 cm at 28.50 m S (Figures 7.15 and 7.16a). The next stratum (4) consists of a 15 cm thick, brown sandy clay loam. The southern edges of both of these strata have been truncated by wave action. Stratum 3, a very dark grayish brown sandy clay, has a wedge-shaped profile and extends to 70 cm along the south wall and pinches out at 20 cm at the north wall. A few large gravels occur at the contact with the next stratum (2), a Unit C yellowish brown gravelly sand. A stratigraphic probe in the southwestern corner of the unit indicates that this Unit C gravelly sand also pinches out at the extreme southern end of the unit and is underlain by a well-sorted, reddish brown sand.

NORTH WALL



0 50cm

EAST WALL



- 4 - VERY DARK BROWN SILTY CLAY LOAM, STRONG CAC03 REACTION.
- 3 - VERY DARK GRAYISH BROWN GRAVELLY SANDY CLAY, STRONG CAC03 REACTION.
- 2 - REDDISH BROWN WEAK SANDY LOAM, STRONG CAC03 REACTION.
- 1 - LIGHT, BROWNISH GRAY SANDY CLAY, VIOLENT CAC03 REACTION.

Figure 7.12. Profile of Excavation Unit 25-26 m S/31-35 m W.



Figure 7.13. North wall of Excavation Unit 25-26 m S/31-35 m W.

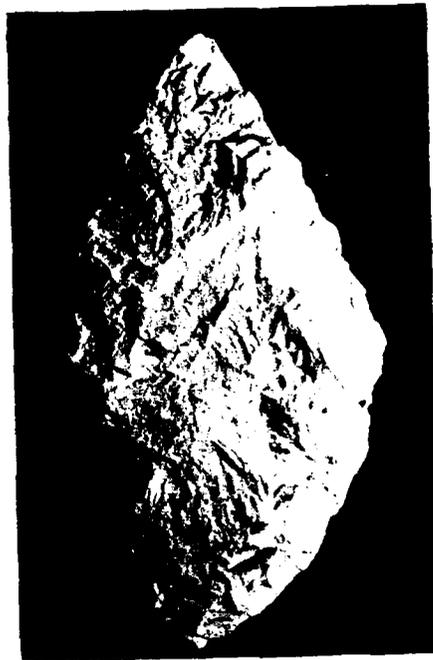
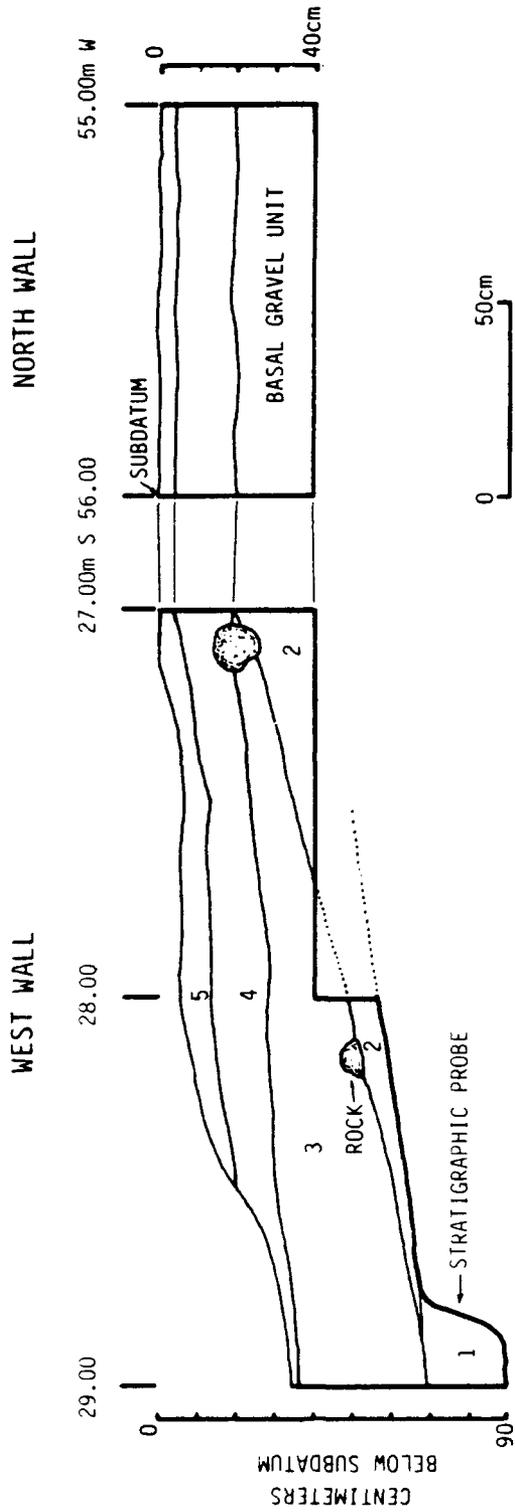


Figure 7.14. Biface from Excavation Unit 25-26 m S/31-35 m W (scale 1:1).



- 5 - DARK BROWN SANDY CLAY, VIOLENT CAC03 REACTION
- 4 - BROWN SANDY CLAY LOAM, STRONG CAC03 REACTION
- 3 - VERY DARK GRAYISH BROWN SANDY CLAY, VIOLENT CAC03 REACTION
- 2 - YELLOWISH BROWN GRAVELLY SAND, STRONG CAC03 REACTION
- 1 - REDDISH BROWN SAND, STRONG CAC03 REACTION

Figure 7.15. Profile of Excavation Unit 27-29 m S/55-56 m W.



a



b

Figure 7.16. West wall of Excavation Unit 27-29 m S/55-56 m W (a) and west wall of Excavation Unit 24-26 m S/69-70 m W (b).

Four flakes of Tongue River silicified sediment were recovered from the 10 to 20 cm level within the north half of the unit (see Table 7.1). This corresponds to the brown sandy clay loam (Stratum 4) near its contact with the lower dark grayish brown sandy clay (see Figure 7.15). Given this position, these materials are thought to be late Paleoindian in age.

Excavation Unit 24-26 m S/69-70 m W (UND 329-331 m N/479-480 m W):

This unit was placed south of the willow thicket. Five soil samples were taken from the profile of this unit for the sediment, phytolith, pollen and mollusk analyses. The first 20 to 25 cm consist of a black silty clay (see Figures 7.16b, 7.17 and 7.18). The next stratum is a very dark grayish brown silt loam which extends to approximately 50 cm in the southern half but pinches out at approximately 24.30 m south. Below this is a very dark gray clay loam which grades to a sandy loam near the bottom. Although the physical and chemical analyses of the lower portion of this stratum (soil sample 4), are almost identical to Ahler et al.'s (1977:28-29) Unit B characteristics, no boundary is evident between soil samples 3 and 4. It overlies a Unit C dark gray silty clay loam encountered at 70 to 80 cm. A stratigraphic probe found the "gray clay" to extend to approximately 115 cm where a dense concentration of carbonates was encountered.

Several pieces of unidentifiable bone were recovered from this unit (see Table 7.1). One burned bone fragment was recovered from 60 to 70 cm.

Shovel Test Excavation

Twenty-two shovel tests were excavated in the northern portion of the site on either side of the vehicle trail in order to determine the extent of site and the depth of potential artifact-bearing sediments (see Figure 7.1). As noted in Chapter Six, the University of North Dakota's coordinant system was utilized for the shovel tests. All shovel tests were excavated to what appear to be the Unit C gravels. The shovel tests resulted in the recovery of four flakes and eight unidentifiable bone fragments (see Table 7.1), all of which occur in the extreme eastern portion of the site (i.e., 345-355 m N/360-380 m W). The profiles for the shovel tests located along the 345N line are illustrated in Figure 7.19. This particular area of the site contains from 70 to 80 cm of fine sediments above Unit C gravels. From 380 to 440 m W there is an average of 50 cm of fine sediments and this decreases rapidly to little or no fine sediments westward from 450 m W.

The second series of shovel tests, placed along the 355 m N line, exhibit a similar profile (Figure 7.20). Approximately 60 to 90 cm of fine sediments occur from 370 to 400 m W. This decreases to 10 to 20 cm westward from 410 m W. These shovel tests are located in the area of the abandoned gravel quarry and most of the tests either encountered gravels, disturbed deposits, or both.

WEST WALL

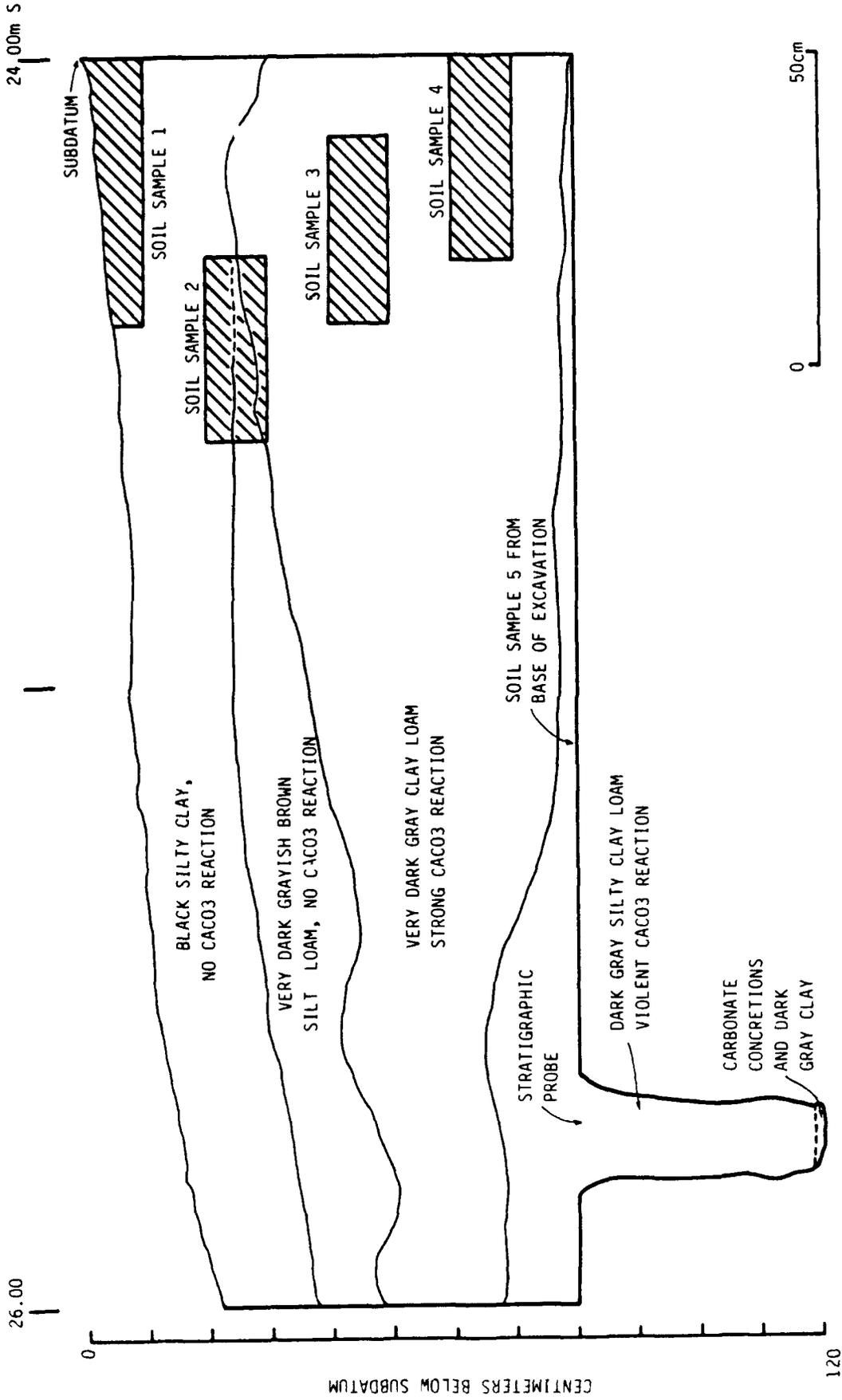


Figure 7.17. Profile of Excavation Unit 24-26 m S/69-70 m W.

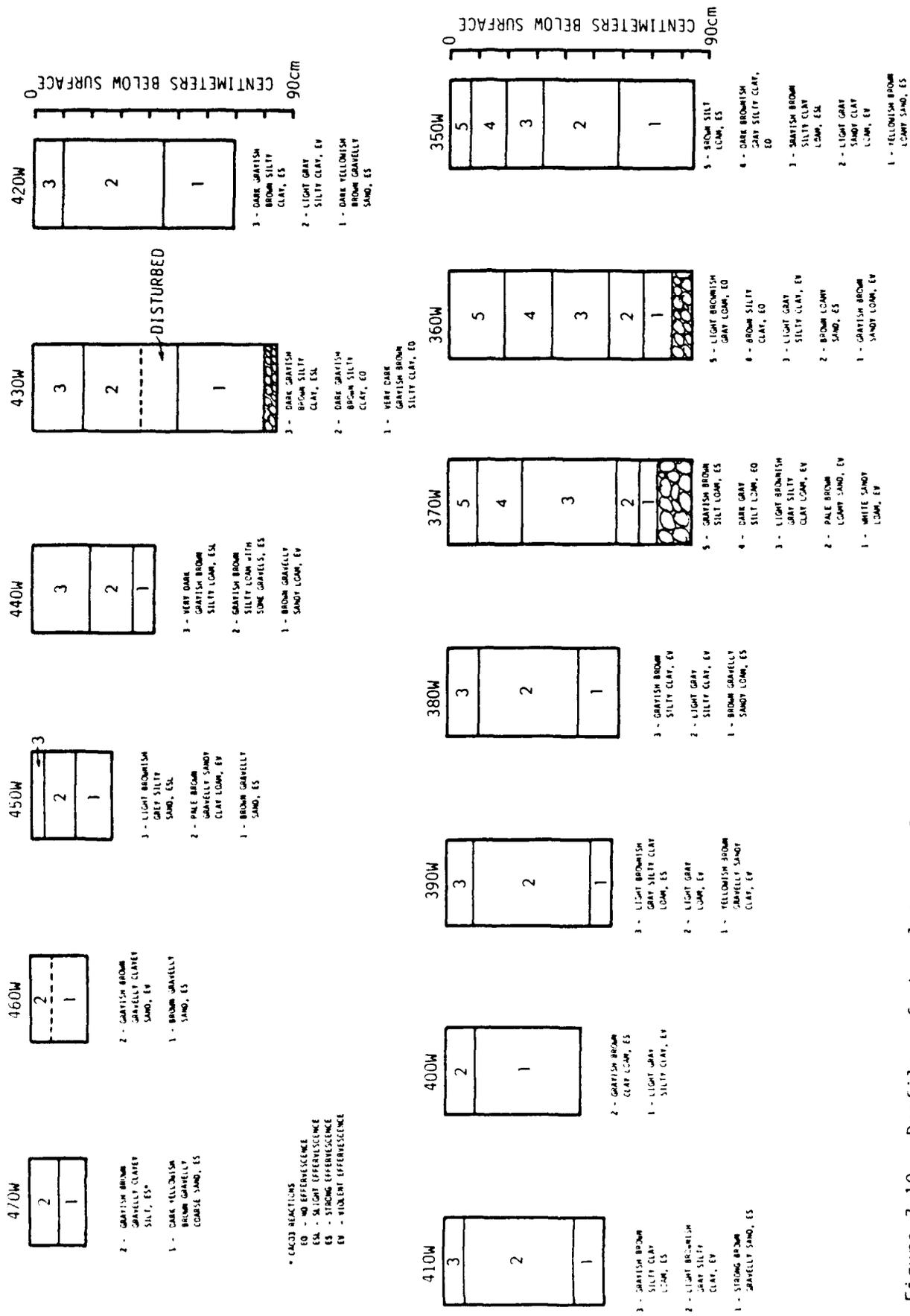


Figure 7.19. Profiles of shovel tests along the 345 m N line.

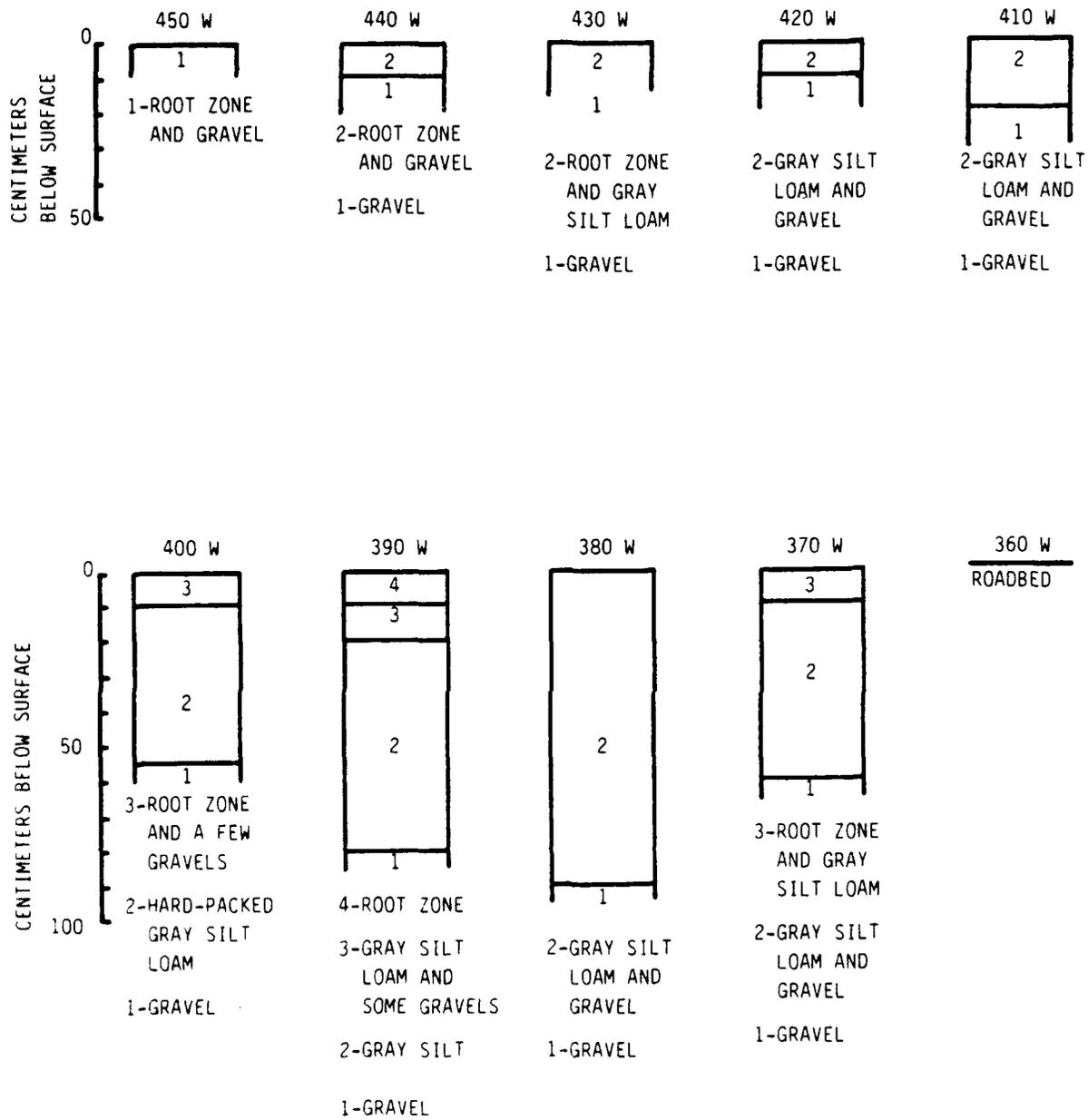


Figure 7.20. Profiles of shovel tests along the 355 m N line.

Mechanical Excavation

Two backhoe trenches were excavated at the site. Backhoe Trench 1 was excavated across the present beach along the eastern margins of the cultural zone (see Figure 7.1) as determined by Ahler (1980). The trench was extended approximately five meters on to the upper terrace. As noted in Chapter Six, mechanical screening of the excavated sediments was initially proposed but was not feasible due to the high moisture content in the clay sediments. No cultural materials were observed during the excavation. The trench was excavated into the underlying Unit C gravels and revealed a profile which documents the site's complex stratigraphy (Figure 7.21).

The lowest stratum (1) is comprised of generally poorly sorted, rounded alluvial sands and gravels with colors ranging from grayish to dark brown (Figure 7.22a). The characteristics of this stratum are comparable to Ahler et al.'s (1977) Unit C sand and gravel variant and is also similar to the strata exposed in Excavation Unit 0-1 m N/60-61 m W. The undulating surface, clast size and clast shape of this stratum is characteristic of high energy river deposition. The stratigraphy of the upper strata has been truncated by wave action and it is difficult to trace the relationships of the overlying strata in the southern end of the backhoe trench with those occurring in the cutbank.

Stratum 2 is a dark grayish brown gravelly clayey silt which ends with a concentration of gravels at 10 m N (Figure 7.22a). This deposit is massive and poorly sorted. Combined with the gravel concentration on the downslope end, it suggests that this stratum is an outwash or a channel deposit similar in origin to Ahler et al.'s Unit B. It is overlain by a series of finer non-gravel sediments to the south including an apparent Unit C "gray clay." The presence of other fine sediments (strata 8 and 9) situated between the gray clay and underlying Unit C gravels indicates that these two strata are also Unit C variants, but ones not described by Ahler et al. (1977). In the northern end of the trench strata 1 and 2 are overlain by a series of dark brown silts which are equivalent to Ahler et al.'s Unit A. A different sequence occurs in the southern end of the trench.

In the area from 0 to 10 m N, the lower Stratum 1 sands and gravels appear to be truncated at 3 m N and filled with a black sandy clay, similar to the black coarse sand that fills a depression at 8 m N. Both are believed to be related to an organic-rich slough or bog deposit (Figure 7.22b). The next stratum is a mottled, very dark grayish brown, clayey sand which is overlain by a very dark brown silt loam. Above this is a dark grayish brown sandy clay which is considered to be equivalent to Ahler et al.'s Unit C "gray clay." The latter is overlain by a very dark brown silty loam (Stratum 11). The uppermost stratum, (12) consists of a light yellowish brown silt loam. Due the lack of the sand fraction which is apparently the key characteristic of the Unit B deposits (cf. Ahler et al. 1977:28-29) as well as the similarity of these strata to those found within the cutbank (see Figure 7.21), the upper two strata are considered to be Unit A deposits.

Backhoe Trench 2 was excavated north of and perpendicular to the vehicle trail. Figure 7.23 depicts the profile of the west wall of the

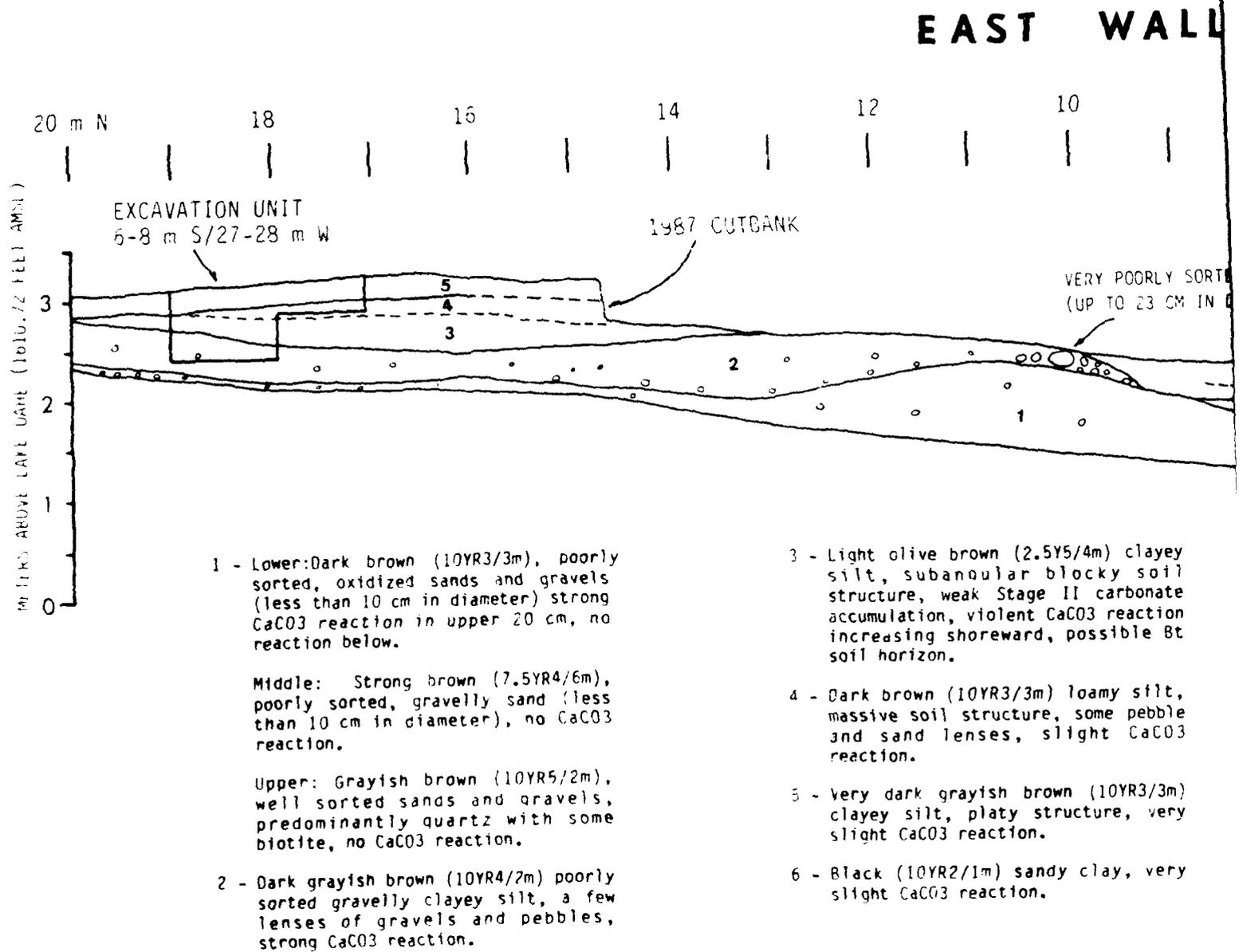
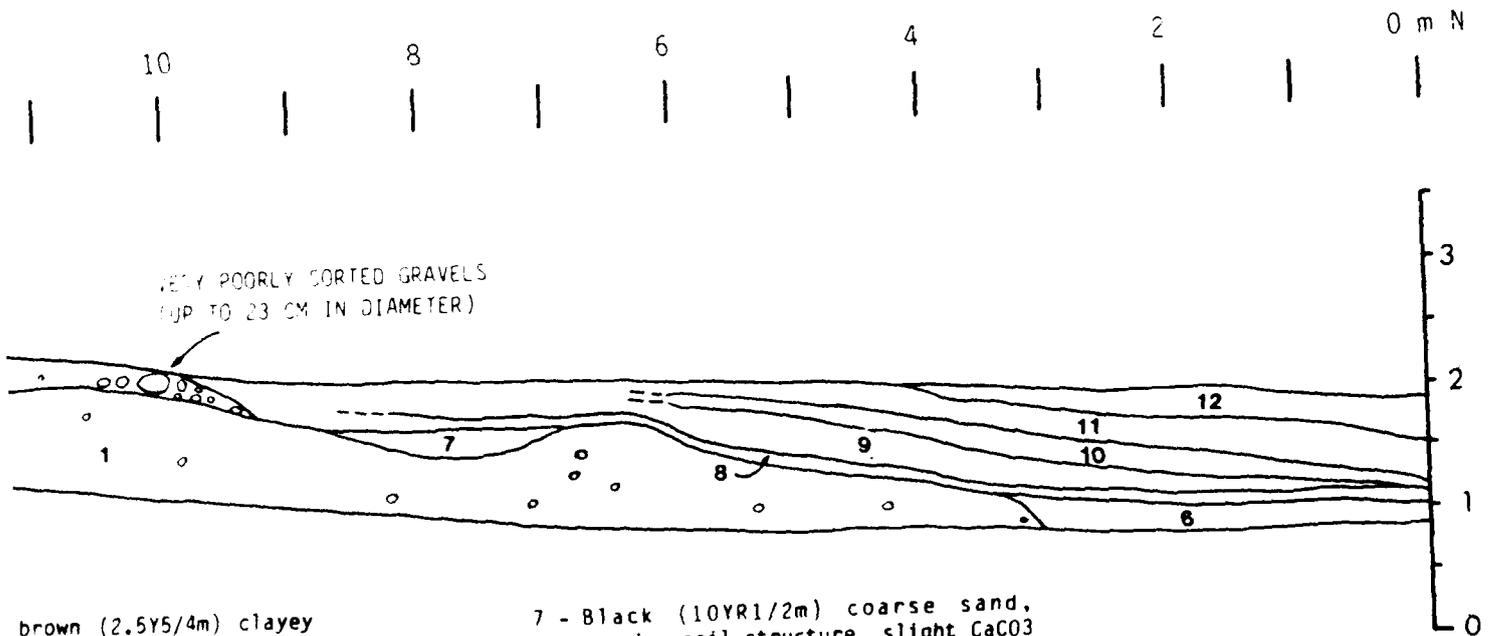


Figure 7.21. Profile of Backhoe Trench 1.

10F2

AST WALL



1 - brown (2.5Y5/4m) clayey nodular blocky soil weak Stage II carbonate, violent CaCO₃ reaction shoreward, possible Bt

2 - 10YR3/3m) loamy silt, platy structure, some pebbles, slight CaCO₃ reaction.

3 - grayish brown (10YR3/3m) platy structure, very violent CaCO₃ reaction.

4 - 10YR3/3m) sandy clay, very violent CaCO₃ reaction.

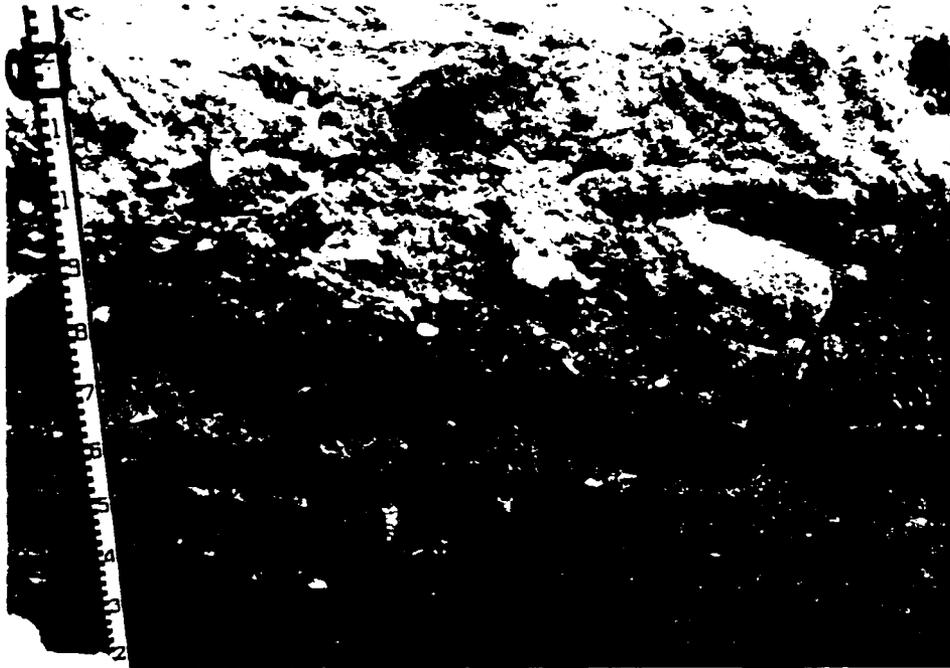
7 - Black (10YR1/2m) coarse sand, massive soil structure, slight CaCO₃ reaction, possible slough or bog deposit (no visible plant remains).

8 - Very dark grayish brown (10YR3/2m) clayey sand with strong brown (7.5YR5/8m) mottles.

10 - Dark grayish brown (10YR4/2m) sandy clay, violent CaCO₃ reaction, (Unit C "gray clay").

9, 11 - Very dark brown (10YR2/2) silty loam, violent CaCO₃ reaction.

12 - Light yellowish brown (2.5Y6/4m) sandy loam, violent CaCO₃ reaction, (probable Unit B sand).



a



b

Figure 7.22. East wall of Backhoe Trench 1: Unit C gravels at 10-11 m N (a) and organic rich deposit at 7-8 m N (b).

WEST WALL

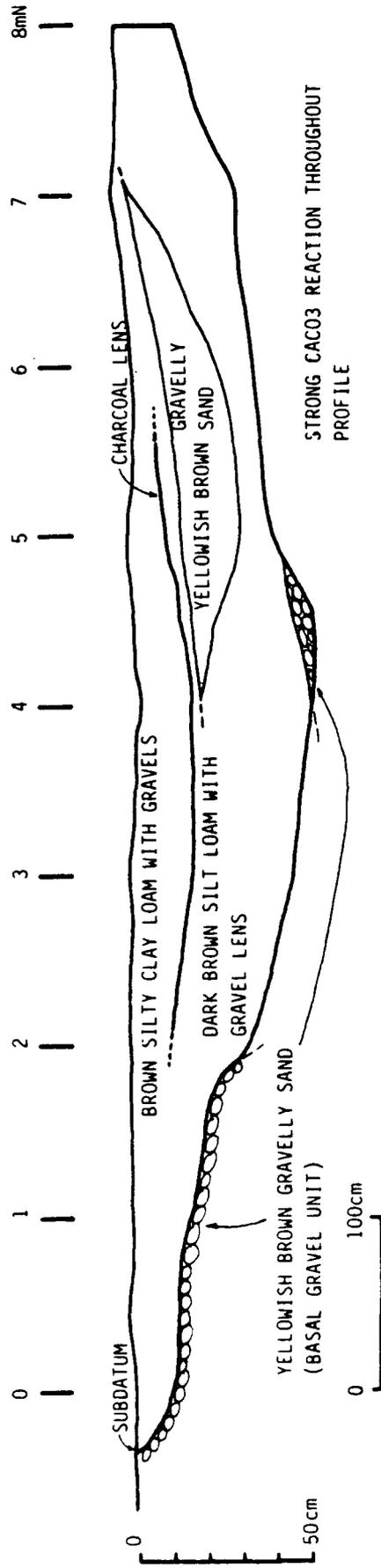


Figure 7.23. Profile of Backhoe Trench 2.

trench. The profile shows a bottom stratum of undisturbed yellowish brown sand and gravels which was subsequently filled with a combination of silts, sands and gravels. A one to two cm thick charcoal lens also occurs within this trench, similar to that found in Excavation Unit 20-21 m N/60-61 m W. These deposits are considered to be recent in age due to their mixed appearance and probably represent the refilling of the gravel quarry.

Artifact Analysis

The archeological investigation of the Travis 2 site yielded very few cultural items. These have been listed previously in Table 7.1 by their respective proveniences. Table 7.2 provides a summary of these cultural materials. A total of 33 flakes, 1 core, 1 biface, and 17 bone fragments were obtained from the excavation units. In addition, four flakes and eight bone fragments were recovered from the shovel tests while two projectile points and two bone fragments were found on the surface of the site (see Table 7.1). Except for the burned bone, which is assumed to be the result of cultural activities, none of the other bone fragments exhibited any cultural modifications (e.g., cut marks). As a result, it is not known if the bone fragments are cultural or were deposited through natural processes.

As shown in Table 7.2, most of the lithic materials were recovered from the 10 to 20 and 30 to 40 cm levels. The materials recovered from the latter level were obtained from Excavation Unit 25-26 m S/31-35 m W. Stratigraphically, this level is believed to be associated with the late Paleoindian component. The area around this excavation unit also has the best potential for containing additional buried cultural materials.

Although the 1987 artifact assemblage is quite small, it may be useful to compare the 1987 assemblage to the assemblage obtained by Ahler et al. (1977). Two tools (including cores) and 33 pieces of debitage were collected from the 1987 excavation units (see Table 7.2). This compares to 34 tools and 543 pieces of chipped stone debris recovered by Ahler et al. (1977:Table 26) from excavation. Approximately half of the latter (251) were recovered from Feature 1. Deleting the Feature 1 data, the tools comprise 10.7 percent of the 1976 assemblage compared to 5.7 percent of the 1987 assemblage. Given the different sample sizes, the two assemblages appear to be considered quite comparable.

Two other comparisons are provided to determine if the raw material types and degree of patination are appreciably different between the two assemblages. Table 7.3 lists the raw material type by level. The most useful comparison is the percent of Knife River flint. The 1987 assemblage is comprised of 48.6 percent of Knife River flint (including brown chalcedony). This compares quite closely to Ahler et al.'s (1977:103) percentages, where 47.5 percent of the chipped stone debris and 64.7 percent of the tool assemblage was comprised of Knife River flint and brown chalcedony.

Table 7.4 lists the degree of patination which occurs mainly on the Knife River flint and brown chalcedony materials. Patination occurs on 15 of 19 items in the 1987 assemblage, or approximately 80 percent. With the exception of Feature 1, Ahler et al. (1977:46) found that 90 percent of the

Table 7.2. Summary of collected cultural materials from excavation, by level.

<u>Level</u>	<u>Flakes</u>	<u>Shatter</u>	<u>Tools</u>	<u>Bone</u>
0-10 cm	3	2	0	1
10-20 cm	6	2	0	1
20-30 cm	2	0	1 (core)	0
30-40 cm	11	3	1 (biface)	6
40-50 cm	3	1	0	4
50 cm	<u>0</u>	<u>0</u>	<u>0</u>	<u>5</u>
Totals	25	8	2	17

Table 7.3. Raw material types from excavation, by level.

<u>Level</u>	<u>Knife River Flint*</u>	<u>Tongue River Silicified Sediment</u>	<u>Chalcedony</u>	<u>Chert</u>	<u>Quartzite</u>	<u>Petrified Wood</u>
0-10 cm	3	0	0	1	0	0
10-20 cm	2	4	1	1	0	0
20-30 cm	3	0	0	1	0	0
30-40 cm	6	2	0	5	1	1
40-50 cm	<u>3</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Totals	17	7	1	8	1	1

* includes brown chalcedony

Table 7.4. Patination of Knife River flint from excavation, by level.

<u>Level</u>	<u>Dorsal Surface</u>				<u>Ventral Surface</u>			
	<u>Heavy</u>	<u>Moderate</u>	<u>Slight</u>	<u>None</u>	<u>Heavy</u>	<u>Moderate</u>	<u>Slight</u>	<u>None</u>
0-10 cm	0	0	2	1	0	0	2	1
10-20 cm	1	1	0	2	0	1	1	2
20-30 cm	0	0	2	1	0	0	0	3
30-40 cm	3	2	2	0	3	1	3	0
40-50 cm	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>
Totals	4	3	8	4	3	2	7	7

assemblage exhibited some degree of patination, suggesting that the cultural materials were exposed to some degree of weathering prior to burial. The Feature 1 artifacts, however, exhibited a much lower percentage (between 30 and 45 percent) indicating more rapid burial in this particular area of the site (308 m N/450 m W on the UND grid system). The data from the 1976 and 1987 assemblages therefore indicate a similar rate of burial for most of the site area.

Soil Sediment Analysis

A series of five soil samples were taken from the profile of Excavation Unit 24-26 m S/69-70 m W (see Figure 7.17) for physical and chemical analyses of the sediments. Table 7.5 lists the results of the various analyses. Samples 1 through 3 are comprised of well to moderately sorted, very fine to medium sand which shows no reaction to hydrochloric acid. These samples are comparable to the characteristics described for Unit A by Ahler et al. (1977:Tables 2 and 3) which is probably the result of aeolian deposition of glaciofluvial sediments occurring along the Missouri River. As noted earlier (see discussion of Excavation Unit 24-26 m S/69-70 m W), sample 4 is nearly identical in sand, silt and clay percentage and relatively high calcium carbonate content as the Unit B sand. In addition, sample 5 has similar particle size percentages and carbonate characteristics to those of the Unit C "gray clay" (Ahler et al. 1977:Table 3).

Pollen Analysis

Table 7.6 presents the results of the pollen analysis from the five bulk samples (see Figure 7.17). The pollen record at this site exhibits some signs of deterioration, as most of the pollen grains were eroded to some degree. There may be both mechanical and microbial factors acting to destroy pollen in these soils. Previous analysis of soil from this site (Ahler et al. 1977) recovered pollen from only one of twelve samples extracted. Extraction methods based on the use of heavy liquids, such as zinc bromide, are frequently more effective than digestive procedures in extracting pollen from soils which are pollen-poor. It should be noted that the pollen in sample 5 from a depth of 80-90 cm below the present ground surface was in a slightly better state of preservation than most of the pollen from the levels above.

The pollen record at this site displays an interesting pattern of dominance by Chenopodiaceae pollen throughout most of the record (samples 1 through 4), with little variation in other non-arboreal pollen frequencies (Figure 7.24, Table 7.6). This suggests that relatively consistent conditions may have prevailed through this interval. Chenopodiaceae appear to have been either primary elements of this vegetation or to have occurred abundantly within the grassland as forbs. Erosion has removed an undetermined amount of sediments from this terrace and it is not possible to determine how recent the upper sediments may be. There was, however, no evidence of pollen grains that appear to represent contamination from recent pollen rain.

Table 7.5. Soil sediment analysis of five samples from the Travis 2 site, 39WW15.

Sample	pH	% CaCO ₃	% Sand	% Coarse Silt	% Fine Silt	% Total Silt	% Clay
1	7.2	0.00	29.62	26.38	25.02	51.40	18.98
2	7.2	0.00	20.82	29.42	28.01	57.43	21.75
3	7.3	0.00	36.23	20.78	25.63	46.41	17.36
4	7.6	1.29	63.24	12.48	11.07	23.55	13.21
5	8.0	34.96	22.56	12.67	21.80	34.47	42.97

	Soil Texture	Geologic Texture	CaCO ₃ Reaction
1	Silt Loam	Sandy Silt	None
2	Silt Loam	Sandy Silt	None
3	Loam	Sandy Silt	None
4	Sandy Loam	Silty Sand	Strong (forms casts)
5	Clay	Sand Silt-Clay	Violent (jumps out)

	Color Moist	Color Dry
1*	10YR4/2 dark grayish brown	10YR4/2 dark grayish brown
2	10YR4/3 brown/dark brown	10YR4/2 dark grayish brown
3	10YR4/3 brown/dark brown	10YR4/2 dark grayish brown
4	2.5Y4/2 dark grayish brown	2.5Y5/2 grayish brown
5	10YR4/2 dark grayish brown	10YR6/1 light gray/gray

* Sample 1: Approximately 20% of the surface area had strong brown (7.5YR5/8) colored stains about the roots.

15X Stereoscope Examination

- 1 Very fine sand; moderately sorted; abundant clear quartz and biotite; 15% sub-rounded, medium sand; high shrink-swell.
- 2 Very fine sand; well sorted; decrease in medium sands, one granule purple granite; moderate shrink-swell.
- 3 Medium sand; moderately sorted; abundant very light green quartz; moderate shrink-swell.
- 4 Medium-coarse sand; abundant clear sub-rounded quartz with a roundness of .5 and sphericity of .7; trace (less than 5%) of milky limestone; moderate shrink-swell.
- 5 Very fine sand; in 10% HCl only medium-coarse quartz and very fine grains not destroyed; 5% medium grained milky limestone; moderate shrink-swell.

Table 7.6. Pollen types observed in samples from the Travis 2 site, 39WW15.

	Common Name
ARBOREAL POLLEN:	
Betulaceae	Birch family
<u>Pinus</u>	Pine
<u>Populus</u>	Cottonwood
<u>Ulmus</u>	Elm
NON-ARBOREAL POLLEN:	
Cheno-ams	Includes amaranth and pigweed family
Compositae:	Sunflower family
<u>Artemisia</u>	Sagebrush
Low-spine	Includes ragweed, cocklebur, etc.
High-spine	Includes aster, rabbitbrush, snake-weed, sunflower, etc.
Liguliflorae	Includes dandelion and chickory
<u>Erodium</u>	Filaree
Gramineae	Grass family
Rosaceae	Rose family
<u>Sphaeralceae</u>	Globe mallow
Umbelliferae	Parsley/carrot family

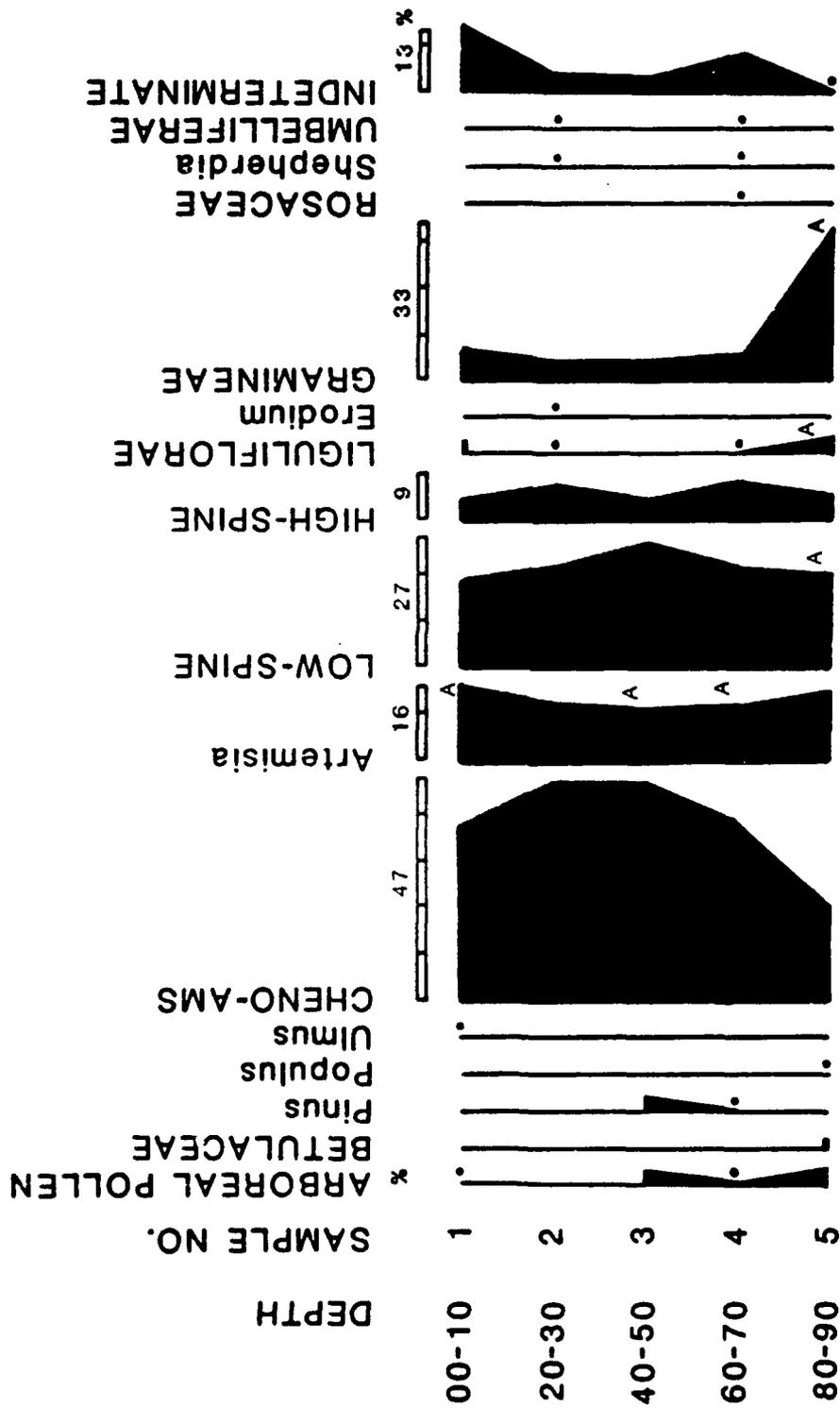


Figure 7.24. Pollen diagram from the Travis 2 site, 39WW15.

The lowest pollen sample exhibits a large frequency of Gramineae pollen, indicating a change in vegetation between that level and the more recent samples. There was also a slight increase in Liguliflorae pollen, as well as aggregates of this pollen type, in the lowest sample. The large quantity of Gramineae pollen, as well as the elevated Liguliflorae pollen, suggests the presence of a prairie grassland or meadow vegetation that was different from succeeding associations. Cheno-am pollen was observed in a relatively low frequency in this sample, suggesting that this element of the vegetation community was not very abundant. The Betulaceae pollen may represent a member of the birch family growing along the Missouri River at this time. The only evidence of probable pollen contamination comes in this lowest sample. The single Populus pollen grain encountered was in a remarkably good state of preservation. In light of the fragility of this pollen, and the fair state of preservation of most of the rest of the pollen, it is likely that this grain is present through contamination from the modern community.

Pollen analysis at the Ray Long site (39FA65), another Late Paleoindian locality in South Dakota, produced a pollen record dominated by sagebrush (Artemisia) pollen and containing large quantities of High-spine Compositae pollen (Scott and Lewis 1986). The difference in pollen records probably reflects a difference in local vegetation. Phytolith analysis was also conducted at the Ray Long site and added to the interpretation of paleoenvironmental conditions. The lowest component at the Ray Long site appears to have been relatively cool and mesic, according to the phytolith record. The pollen record from the Travis 2 site suggests differences in vegetation in the lowest component, possibly cooler and more mesic, supporting a large grass community.

Pollen recovery at the Travis 2 site was surprising as previous work at this site had not yielded sufficient quantities of pollen for analysis (Ahler et al. 1977). The pollen recovered at the site is badly eroded but suggests that the vegetation and probably paleoenvironmental conditions were relatively stable at the time of occupation and for some time prior to occupation. The pollen record is dominated by Cheno-ams which may represent either the major element of the vegetation or forbs within the local grassland. The lowest component sampled for pollen contained a greatly elevated quantity of grass pollen suggesting that at the earliest interval's conditions may have been cooler and/or more mesic to support a dense grassland.

Opal Phytolith Analysis

Phytolith analysis was carried out on five bulk samples (see Figure 7.17) from the Travis 2 site. Samples 1, 2 and 3 contained sufficient phytoliths to count 200 individuals. Samples 4 and 5 had less abundant silica, particularly silica-bodies characteristic of grasses. Table 7.7 lists phytolith density and distribution for the first three samples. The area factor is calculated by dividing the percent area in sample 1 by that of each of the other samples. It is used to compare counts made on unequal areas. No diatoms were observed in any sample.

Sample 1 has the highest density of phytoliths; the scan was continued until 100 silica-bodies were recorded (see Table 7.7). An equal number of

Table 7.7. Density information and phytolith counts for samples 1, 2 and 3, the Travis 2 site, 39WW15.

Sample	<u>Densities</u>					
	Total Phytoliths	Count Area*	Density (Total/Count)	Slide Area*	% Area	Area Factor
1	299	5.88	50.8	186	3.2	1
2	246	5.92	41.6	192	3.1	1
3	308	17.14	17.9	224	7.7	0.4

* Areas in square millimeters.

Sample	<u>Phytolith Counts</u>							
	Phytolith Categories							7/1-6
	1	2	3	4	5	6	7	
1	38	1	8	27	43	78	100	100/199
	Plate: 4							0.5
2	18		9	12	30	83	16	16/230
	Plate: 29							0.07
	Platy Rectangle: 49							
3	18		5	3	21	98	27	27/281
	Plate: 43							0.10
	Platy Rectangle: 93							

see Chapter Six for a description of categories 1 through 7.

Sample	<u>Grass Silica-Bodies</u>						
	Sinuus	Pentagon	Rect.	Rondel	Dumb.	Cross	Saddle
1	8	1	7	49	3	0	32
	Tilted: 115						
2	2	0	0	7	0	0	7
	Tilted: 16						
3	0	0	1	20	0	0	6
	Tilted: 27						

Rect. = Rectangle Dumb. = Dumbbell

tilted silica-bodies were observed. Most of the phytoliths, however, are in other categories and indicate presence of other plant taxa. None of these phytoliths are as yet identifiable to a taxon. Trichomes, which might prove identifiable, are predominantly triangular solid types (Figure 7.25a) recorded in grasses and the Ulmaceae (Mulholland 1987). The base of one cone (from grasses or sedges) was also observed. Eight bulliform cells (Figure 7.25b) were recorded, indicating grasses.

The silica-bodies include 32 percent saddles, indicating presence of Chloridoid grasses (see Table 7.7). Rondels, the most numerous type (49 percent), are most numerous in the Pooideae but also occur in most other taxa. Sinuous and rectangles (15 percent) are indicative of the Pooideae. Only three dumbbells were recorded; they could be from the Panicoideae since none are the special types noted in other subfamilies.

Sample 2 has a density only slightly less than that of sample 1. However, the amount of silica-bodies is significantly less. Only 16 (and 16 tilted) were observed, compared to 100 (plus 115) for sample 1; the area scanned (both absolute and percentage of total) and number of other phytoliths are fairly constant between the two samples. The silica-bodies are too few for accurate interpretation but indicate presence of both Chloridoid and Poid species. Trichomes are all of the triangular type. Of the nine bulliform cells, eight were weathered deeply; only one definite bulliform cell was recorded.

Sample 3 has a much lower density of phytoliths, less than half that of samples 1 and 2. Although more silica-bodies were observed than in sample 2, comparisons must take into account the greater area covered. Multiplying by the area factor indicates 11 silica-bodies, similar to the 16 observed in sample 2. Most of the silica-bodies are rondels; a few saddles indicate presence of Chloridoids. Trichomes are all triangular; a few bulliform cells are present.

Samples 4 and 5 were examined briefly. Only one silica-body was seen in each (over 2.98 and 3.64 mm² respectively). Other phytoliths were present but not abundant.

The other fractions (sand, clay, heavy, and light) generally did not contain phytoliths. Those of sample 1, however, did have some identifiable phytoliths in all fractions except light. Abundance was not as high as in the phytolith fraction but some were observed. The procedure does not recover 100 percent of the phytoliths.

In summary, sample 1 has abundant phytoliths, including grass silica-bodies. Both grasses and nongraminaceous taxa contributed to the sediment. Grasses included both Poooids and Chloridoids. Chloridoids were probably more numerous than Poooids, since rondels cannot be confidently assigned to the Pooideae only. A small amount of Panicoids may have contributed to the sediment or, alternatively, species from the Stipeae may have been present (even though no special dumbbell types were observed). Nongraminaceous taxa cannot be identified at this time. Although trichomes may prove to be identifiable, the only types observed in these samples have been reported from the widely separated taxa Gramineae and Ulmaceae.



a



b

—
10 micrometers

Figure 7.25. Light micrographs of trichome (a) and bulliform (b) phytoliths from the Travis 2 site, 39WW15.

Samples 2 and 3 contain significantly fewer silica-bodies, indicating a drop in the contribution from grasses and a corresponding increase in nongraminaceous contributors. Both Poooids and Chloridoids are indicated, although amounts are too low to accurately interpret relative abundance. Sample 3, in addition, indicates a lower total quantity of silica. Samples 4 and 5 contain even lower amounts of total silica and grass silica-bodies.

The samples seem to indicate one of two sequences: (1) changing vegetation from low (samples 4 and 5) to higher (samples 2 and 3) silica production, with grasses abundant only at the top (sample 1) of the sequence; or (2) increasing weathering with greater depth, with silica-bodies (due to smaller size) dissolving before the other phytolith types. The similar quantities but different distribution of phytoliths between samples 1 and 2 would support hypothesis 1. The steady decrease in both total phytoliths and in grass phytoliths in samples 3, 4, and 5 supports the second hypothesis (i.e., increased weathering with greater depth).

Gastropod Analysis

Results of the gastropod analysis from the bulk matrix samples (see Figure 7.17) are presented in Table 7.8. Sample 3 produced no gastropods, and two samples (1 and 2) yielded only unidentifiable fragments. Gastropods in sample 4 were sparse, while in sample 5 they were abundant. By comparison with those samples reported in Ahler et al. (1977), the upper levels contain fewer individuals, while the lowest level produced over twice the total number of all samples in the previous study. In Table 7.8, Gastrocopta sp. includes juveniles and upper fragments which clearly belong to the genus Gastrocopta. Based on size and upper morphology, most, if not all, of these are Gastrocopta pentodon, but assigning them to the species level without the presence of the aperture is questionable. Both genera Succinea and Catinella are not identified to the species level. Criteria for species determination in these two genera are based on soft part anatomy, particularly genitalia, and are not reflected in shell morphology.

The aquatic gastropods pose problems with taphonomy. While aquatics may be present simply as chance (cf. Jaehrig n.d.:81), they are present in very small numbers, as in sample 5, and constitute only a fraction of one percent. However, in the matrix samples in Ahler et al. (1977), aquatics reach as high as 27 percent of samples. As they accurately point out (Ahler et al. 1977:55), these are probably the result of deposition by water. Freshwater snails have a greater probability of mechanical load sorting (Bobrowsky 1984:84). Thus, they may not have originated from the immediate area of the site. Water deposition can adversely affect terrestrial assemblages. Some forms of shells tend to float in water at differential rates. For example, pupiliform shells are more likely to float than succiniform. Thus, samples with high percentages of aquatics should be examined with extreme caution.

In examining the terrestrial assemblage in the matrix samples, three major lines of evidence can be examined. (1) Absolute counts are a relatively reliable indicator of habitat. In processing contemporary samples from a variety of contexts, dry and open areas such as grasslands have fewer snails per unit of volume than a forested habitat. This seems to be in part a result of the high biomass turnover in grasslands with

Table 7.8. Gastropod identifications from bulk matrix samples, the Travis 2 site, 39WW15.

Sample	<u>Aquatic</u>	<u>Terrestrial</u>							Total	Fragments
	<u>Gyraulus parvus</u> (Say)	<u>Gastrocopta pentodon</u> (Say)	<u>Gastrocopta</u> sp.	<u>Succinea</u> sp.	<u>Catinella</u> sp.	<u>Nesovitrea electrina</u> (Gould)	<u>Hawaiiia minuscula</u> (Binney)	<u>Zonitoides arboreus</u> (Say)		
1	-	-	-	-	-	-	-	-	0	1
2	-	-	-	-	-	-	-	-	0	1
3	-	-	-	-	-	-	-	-	0	-
4	-	1	-	1	-	-	1	-	3	74
5	1	50	124	5	3	12	133	1	329	215

rapid cycling into the soil by biological agents versus the slower turnover in forests with more available surface organics. It also appears to be due in part to the relatively more stable moisture in forest leaf litter than in open grassland. (2) Frequency of habitat preference examines the habitat preferred by the relative percentages of species present. (3) Dominant species should be used in interpretation. As small numbers of terrestrials can be found far away from their preferred habitat due to a variety of mechanisms, very low counts in a large sample probably have little interpretive value.

The absolute counts of gastropods in sample 5 is very high (164 per liter). While contemporary samples have not been taken in the area, Jaehnig (n.d.:34) used the general rule that "whenever the snail frequency reaches over 50 snails per liter it can be assumed that conditions on the site were rather moist and a large amount of decaying organic material was available." The first line of evidence, then, indicates relatively moist conditions with available organic material.

The second line of evidence is not as clear cut. Gastrocopta pentodon appears to prefer a dry and open forest habitat. Both Succinea sp. and Catinella sp. may not be readily identified to habitat preference since they cannot be identified to species level. In examining their presence in modern samples in the Midwest, no clear pattern emerges in habitat preference. Both Hawaiia minuscula and Zonitoides arboreus are rather ubiquitous species and are found over a wide variety of habitats. Nesovitrea electrina appears to prefer moist humus in wooded areas. Thus, graphing out these by percentages does not yield much information since about half of the total are either ubiquitous species or are unknown as to habitat preference.

Looking at dominant species yields much more information. In contemporary samples from the Midwest, both Gastrocopta pentodon and Hawaiia minuscula attain dominant or co-dominant positions in samples from dry and open habitats (cf. Jaehnig n.d.:39). Both are relatively drought tolerant. As these two species form the co-dominants in sample No. 5, it appears that the microenvironmental conditions in this portion of the depositional Unit C probably represent a somewhat open forest. The amount of moisture appears to have been fluctuating as the co-dominants are both drought resistant species. The large number of snails per unit of volume indicates that moisture may be high at times, particularly early in the life cycle. A large number of specimens recovered are juveniles, indicating that they did not survive their first year. Growth in terrestrial gastropods is highly variable depending on the species and the environment. Growth occurs rapidly at first and ceases with sexual maturity which takes from a few months to about a year, indicating a high death rate within a few months of hatching. It is not, however, possible to determine the cause of death. In looking at sample 4, a similar pattern appears but the sample size is far too small to make any statements on habitat. Samples 1 through 3 contain no adult specimens and nothing can be said about species dominance.

Based on the low absolute counts of total mollusks (a maximum of only 25 snails per liter), it would initially seem that all of the samples analyzed by Ahler et al. (1977:53-55) came from prairie areas. However, this is in direct conflict with the habitat preference of some of the

species identified (e.g., Carychium exiguum) which require moist humus. It appears that the periods of inundation, indicated by the high percentages of aquatics in depositional Units B and C (Ahler et al. 1977:54), may have affected the terrestrial assemblages at least in count. We have no way of assessing the impact of inundation on assemblage structure.

CHAPTER EIGHT SUMMARY AND RECOMMENDATIONS

Thomas K. Larson and Paul H. Sanders

Site Content

It should be stressed that the purpose of the 1987 investigations was not to intensively investigate areas of the Travis 2 site known to have the best likelihood of containing in situ materials. Our main objective was to explore around the periphery of the site's core area in order to better define the extent of intact cultural deposits. For this reason it is not surprising that the 1987 results, at least in terms of cultural material densities from excavation, are somewhat lower than those from the 1976 excavations.

The surface reconnaissance of the beach area resulted in the discovery of only a very few artifacts. The two projectile points discussed in Chapter Four are the only surface artifacts believed to be diagnostic of age or function.

The best indications of the characteristics of the intact cultural materials from the 1987 studies come from Excavation Unit 25-26 m S/31-35 m W. These materials are very comparable in both type and density to the results from the 1976 excavations (see discussion in Chapter Seven). Their stratigraphic position at the contact of Unit A and Unit C deposits makes it likely that these materials are from the late Paleoindian zone discovered by Ahler et al. (1977). With the possible exception of materials recovered from several shovel tests (see the discussion which follows in the next section), no other in situ cultural level could be recognized in the 1987 excavations.

The 1987 excavations confirmed the presence of the Unit A through Unit C strata described by Ahler et al. (1977). Backhoe trenches and certain of the excavation units seem to have revealed several previously undiscovered substrata within these units. The main culture-bearing stratum seems to be composed of aeolian loess deposits.

Results indicate that the pollen record at the Travis 2 site is fairly consistent in the upper four samples, indicating a grassland environment. If this is the case, it seems likely that changes noted in grass phytolith counts are probably due to increased weathering at greater depths rather than changes in vegetation.

Very few gastropods were recovered from samples 1 through 4 and this is consistent with the finding of Ahler et al. (1977). As noted in Chapter Six, dry, open grasslands tend to support fewer terrestrial gastropods than do forested areas. The possibility that terrestrials have been removed by fluvial actions (see Chapter Six) may be an important clue to site integrity, however, and should not be overlooked in future studies at the

site.

Site Extent

One of the main purposes of the present investigation was to determine the horizontal and vertical extent of the remaining cultural deposits at the Travis 2 site. The determinations presented in this section are based on the recovery of cultural material from the various excavation units and shovel tests, the geologic context discovered in each excavated unit, and the documented erosion which has taken place since the University of North Dakota studies were conducted.

As previously noted, it is believed that there are no longer intact cultural deposits present in the area at the "SE flat" portion of the site discussed by Weston, Goulding and Ahler (1979:17). The beach areas east of Backhoe Trench 1 are now composed entirely of sand and gravels believed to correlate with Unit C deposits. While occasional artifacts may still be found in this part of the site, they are no longer believed to be associated with an intact cultural zone.

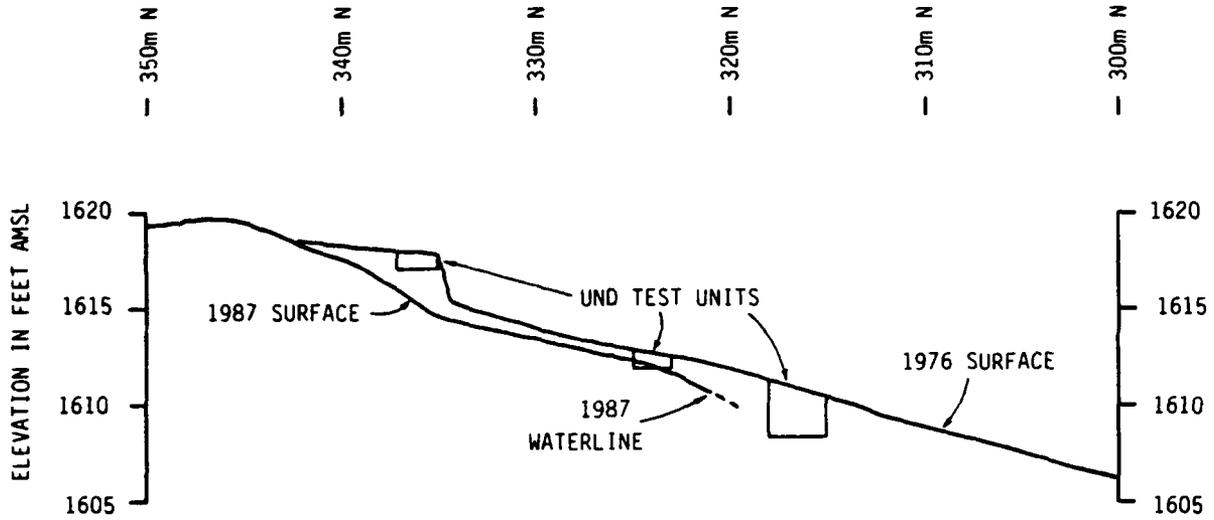
Figure 8.1 illustrates three aspects of the remaining site extent. The dashed line depicts the maximum site extent based on the horizontal limit of the Unit A silts. This is equivalent in concept to Ahler's (1980) depiction of the cultural zone limits in 1979, also shown in this Figure 8.1. The area depicted by a solid line connects excavation units or shovel tests where cultural materials were recovered. Finally, the hatching depicts the area where additional buried cultural deposits are most probable. This assessment is based on both the presence of Unit A strata and proximity to excavated units containing buried cultural materials. The latter area encompasses a very small area.

The results of the shovel tests as well as the three northern excavation units indicate that the site does not extend north of the vehicle trail. The 345 m N line of shovel tests do indicate that fine sediments occur from the present cutbank to the vehicle trail. Additional cultural materials occur along the cutbank in the vicinity of shovel tests 360-380 m W. The cultural materials from these shovel tests were recovered from depths ranging between 15 to 80 cm below the surface.

Areas to the south of the 1987 waterline which were tested by the University of North Dakota in 1976 are no longer considered to have any potential for intact cultural deposits. Two topographic cross-sections of the beach are presented in Figure 8.2. These cross-sections were compiled from the 1976 surface elevations (Ahler et al. 1977: Figure 6) and those gathered during the 1987 site mapping. This comparison shows that the surface of the site has been down cut heavily in the last eleven years. Visual inspections of these parts of the site during periods of calm water also indicated that the lake bed is presently composed entirely of Unit C gravels.

These cross-section profiles also illustrate that a greater amount of erosion has taken place between 330 m N and 340 m N along the 420 m W cross-section in comparison to 450 m W cross-section (see Figure 8.2). The latter area appears to have been partially (and probably temporarily)

1976-1987 SURFACE PROFILE AT 420W



1976-1987 SURFACE PROFILE AT 450W

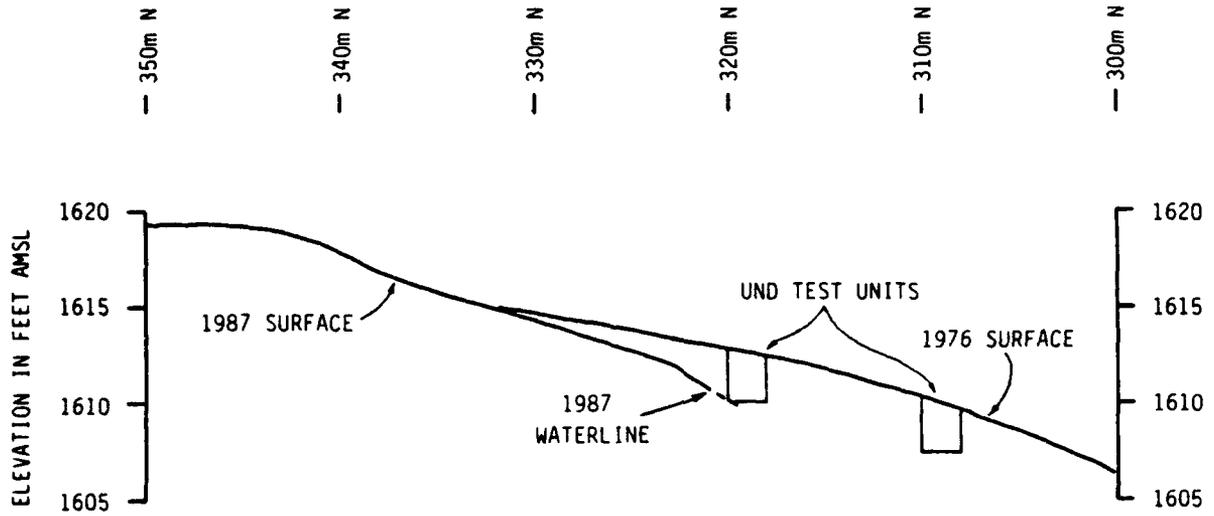


Figure 8.2. Cross-sections of 1976 and 1987 surface profiles.

stabilized by the presence of greater amounts of driftwood which have formed a barrier against wave actions during high lake levels.

Figure 8.3 shows artifact densities across the site area. The contour lines are based on the number of chipped stone tools and debitage per square meter recovered during the 1976 (Ahler et al. 1977) and 1987 (see Table 7.1) excavations. This figure illustrates that the areas containing the highest artifact densities have been destroyed. The best remaining area is in the vicinity of 1987 Excavation Unit 25-26 m S/31-35 m W. The decrease in cultural materials to the east and west of this unit suggests that the most promising areas for additional buried cultural materials would be to the north and northwest.

The depth of the remaining cultural zone also appears to have decreased significantly due to erosion. Whereas the base of the Unit A deposits was approximately 70 to 90 cm below the ground surface in 1976, this contact is now only 30 to 50 cm deep. It is at the base of the Unit A deposits that the Paleoindian materials are believed most likely to occur. Obviously, any of the more recent cultural levels will either be found very close to the present ground surface or, more likely, they have already been destroyed by erosional processes.

Another type of information seems to support the evaluation that the Travis 2 site is considerably smaller than when it was originally discovered. Mr. Travis has indicated that he has found almost no artifacts on the beach surface during the last few years. While one could argue that this is due to increased stabilization of the site, the other lines of evidence do not support this. The lack of cultural materials exposed on the beach in recent years therefore seems to indicate a significant reduction in the amount of intact cultural zone at the site.

Recommendations

As demonstrated by the preceding discussion, it is the authors' belief that very little remains of the Travis 2 site. With the exception of the small amount of the cultural material recovered from several shovel tests, nearly all of the remaining deposits are on the exposed beach areas, probably quite close to the surface.

It is believed that the shallowness of the remaining deposits and their small vertical extent makes stabilization an inappropriate mitigation technique. It seems quite likely that any type of stabilization activity may do more harm than good, and could conceivably destroy what remains of the site. As indicated in the preceding section, the remaining Paleoindian level is believed to be, at best, only 30 to 50 cm below the present ground surface and these depths will probably decrease considerably in only a few years.

It is recommended that the remaining portions of the site containing intact deposits be excavated as soon as possible. This excavation should be completed in two phases. In the first phase, a minimum of 25 percent of the area indicated by hatching on Figure 8.1 should be excavated. The hatched area equates to approximately 775 square meters. This testing should be in the form of spatially dispersed one-by-two meter units which

explore as much of the area indicated as possible. Excavation and analytical techniques should generally follow those employed during the 1987 investigations.

At the completion of the 25 percent sampling process, excavations should be expanded in all the areas found to contain in situ cultural deposits. Every effort should be made to recover the largest and best controlled sample possible within expected time and funding constraints. Data currently viewed as most important to a better interpretation of the Travis 2 site are an increased sample of the in situ lithic assemblage, any feature data present, additional paleoenvironmental data from various parts of the intact zone, and recovery of materials suitable for absolute dating.

We are also in agreement with Ahler (1980) that the final mitigation of impacts to the Travis 2 site must include preparation of a detailed analytical report covering all of the archeological investigations at the site. While the content and scope of this report may be negotiable, it is essential that a synthesis and discussion of the findings be presented in a timely manner.

In sum, the original research topics which have been posed by previous investigators at the Travis 2 site remain to be addressed. While the topics remain the same and may even have become expanded upon as a result of the 1987 investigations, the portions of the site from which data can be gathered have been reduced considerably over the last eleven years. It is likely that only one cultural component (Late Paleoindian) remains in place at the site and erosion is steadily encroaching on these remaining deposits. It therefore seems essential that a data recovery plan for the site be finalized and data recovery efforts be initiated as soon as possible.

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APPENDIX A
FIELD FORMS

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 9-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 20-21N/60-61W

Final Depth: 100 cm Excavators: S. Lund

(B.S. , B.D. X)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0

Faunal Remains: Present: Absent: X

Chipped Stone: No. of debitage: 3, No. of tools: 0

Bone Tools: Number: 0 Ground Stone Number: 0

Ceramics: No. of sherds: 0

Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Rotted ragweed and heavy black soil. Three flakes found.

Level: 2

Depth: 10-20cm

Brown/black soil. Some rocks.

Level: 3

Depth: 20-30cm

Dark soil and rocks and gravel, also a black strip of charcoal at about 27cm.

Level: 4

Depth: 30-40cm

Lots of gravel.

Level: 5

Depth: 40-50cm

Far less gravel, an appearance of sand in some areas, small rocks.

Level: 6

Depth: 50-60cm

Lots of pebbles, some sand, continuance of black wet soil.

Level: 7

Depth: 60-70cm

Gravel and small pebbles at top then more dirt lower, some burned areas and historic trash (recent).

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 9-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 20-21N/60-61W (Continued)

Final Depth: 100 cm Excavators: S. Lund

(B.S. , B.D. X)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0

Faunal Remains: Present: Absent: X

Chipped Stone: No. of debitage: 3, No. of tools: 0

Bone Tools: Number: 0 Ground Stone Number: 0

Ceramics: No. of sherds: 0

Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 8

Depth: 70-80cm

Burned areas, recent trash, wet black soil.

Level: 9

Depth: 80-90cm

Wet black soil.

Level: 10

Depth: 90-100 cm

Almost all heavy wet black soil.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: ON-1N/50-51W

Final Depth: 100 cm Excavators: M. Cartwright

(B.S. , B.D. X)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:

Faunal Remains: Present: Absent:

Chipped Stone: No. of debitage: , No. of tools:

Bone Tools: Number: Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Sod zone (Sod removed and saved). Dark brown sandy loam. Elevations taken from NW corner.

Level: 2

Depth: 10-20cm

Dark brown sandy loam continues until ca. 20 cm, then light clay-type soil mixed with loam.

Level: 3

Depth: 20-30cm

Light clay soil continues with some gravels, rodent(?) intrusion of dark gray clay.

Level: 4

Depth: 30-40cm

Light clay soil, continuation of intrusion of dark gray clay.

Level: 5

Depth: 40-50cm

Light clay soil continues.

Level: 6

Depth: 50-60cm

Dark gray clay soil and cobbles.

Level: 7

Depth: 60-70cm

Dark gray clay continues.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19 87 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 0-1N/50-51W (Continued)

Final Depth: 100 cm Excavators: M. Cartwright

(B.S. , B.D. X)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight:

Number:

Faunal Remains: Present:

Absent:

Chipped Stone: No. of debitage: ,

No. of tools:

Bone Tools: Number:

Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels:

Depths: B.S. , B.D. X

Level: 8

Depth: 70-80cm

Dark gray clay.

Level: 9

Depth: 80-90cm

Dark gray clay with gravel intrusions.

Level: 10

Depth: 90-100cm

Heavy gravel, lighter colored gravel, dark gray clay ends. End of unit.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 4-6, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 0-1N/60-61W

Final Depth: 113 cm Excavators: K. Dueholm

(B.S. , B.D. X)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight:

Number:

Faunal Remains: Present:

Absent:

Chipped Stone: No. of debitage: ,

No. of tools:

Bone Tools: Number:

Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels:

Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Very little vegetation cover, sandy loam, light brown, to 9cm, then dense gravel, some rocks 7-10cm long. No cultural material observed. Elevations taken from NW corner of unit.

Level: 2

Depth: 10-20cm

More coarse gravel and rocks, iron-stained gravels, possibly becoming mostly fine in last 1cm of level. No cultural material observed.

Level: 3

Depth: 20-30cm

Fine reddish gravel to 29cm, then mottled dark gray clay and yellow gravel; fine brown-tan silt in 25cm² area of SW corner throughout level. No cultural material observed.

Level: 4

Depth: 30-40cm

Back to coarse gravel throughout. No cultural material observed.

Level: 5

Depth: 40-50cm

Coarse gravel continues. No cultural material observed.

Level: 6
Depth: 50-60cm

Coarse gravel and rocks continues. No cultural material observed. Last level to be water screened until gravels disappear.

Level: 7
Depth: 60-70cm

Coarse gravel continues. No cultural material observed.

Level: 8
Depth: 70-80cm
Coarse gravels continue, but light colored sand in SE/SE corner at 79-80cm, black sand, SW/SW, =level. No cultural material observed.

Level: 9
Depth: 80-90cm

Sand at 93cm in N half, continues across unit, light tan to heavily dark stained-mottled, especially South half, reddish mottled in N half, to all black mottled sand at 90. No cultural material observed.

Level: 10
Depth: 90-100cm

Black (organic stain?) mottled tan sand. No cultural material observed.

Level: 11
Depth: 100-110 (113)cm

Heavily mottled black sand to 108cm, then coarse gravel again, to bottom of level. Dug down to 113 cm, into the top of gravels. No cultural material present. Entire unit appears to be intact Unit C gravels and sand lenses.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 24, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 6-8S/27-28W
Final Depth: 60 cm Excavators: K.H. Dueholm, S. Lund, P. Sanders
(B.S. , B.D. X)
Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0
Faunal Remains: Present: X Absent:
Chipped Stone: No. of debitage: 4, No. of tools: 0
Bone Tools: Number: 0 Ground Stone Number: 0
Ceramics: Number of sherds: 0
Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Sod zone (thick to 5 cm.). Brown sandy platy loam. No cultural material. Elevations taken from NW corner of unit. Profile of west wall by McFaul during his backhoe trenching profiling.

Level: 2

Depth: 10-20cm

Dark brown silt. Gravel lens at about 15 cm, ca. 1 cm deep. A couple of flakes were recovered from South half of unit (7-8S).

Level: 3

Depth: 20-30cm

Soil the same to 25 cm, then lighter brown, more sand. No cultural material. North half of unit excavated from here on.

Level: 4

Depth: 30-40cm

Soil is a fine, brown, unconsolidated sandy loam. No cultural material.

Level: 5

Depth: 40-50cm

Soil is same, fine, brown, sandy loam. One flake, couple of small bone fragments.

Level: 6

Depth: 50-60cm

Soil is the same. Bottom of level, the north 10cm, is barely into reddish gravels (in matrix of brown soil).

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 4 and 7, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 6-7S/90-91W
Final Depth: 70 cm Excavators: M.L. Wells
(B.S. , B.D. X)
Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0
Faunal Remains: Present: Absent: 0
Chipped Stone: No. of debitage: 2, No. of tools: 0
Bone Tools: Number: 0 Ground Stone Number: 0
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1
Depth: 0-10cm
Weedy ground cover, gray/brown soil with a lot of gravel, root mats.

Level: 2
Depth: 10-20cm
Gray/brown soil, interspersed orange mottling (very thin layer), SE corner down to orangish sandy gravel, large rocks.

Level: 3
Depth: 20-30cm
Soil same, still many fist size and larger rocks, gravel present, SE corner same as above. One flake found in gray/brown soil.

Level: 4
Depth: 30-40cm
Gray/brown soil, large gravel. SE corner orangy sand with many pebbles enlarged to cover half of SE quadrant.

Level: 5
Depth: 40-50cm
Northern half of unit gray/brown soil with lots of gravel. Orangy sand/pebble matrix now covers half of SW quadrant.

Level: 6
Depth: 50-60cm
Sand/pebble area now covers over one half of unit. Color of matrix varies from orange, brick red, gray and tan.

Level: 7
Depth: 60-70cm
NW and NE quadrants taken down to 70cm where the sandy/ pebble matrix now covers entire unit. Southern quadrants remain at 60cm. Unit will be closed.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 21-22 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 16-18S/79-80W

Final Depth: 66 cm Excavators: M.L. Wells, K.H. Dueholm

(B.S. , B.D. X)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Approximately 10 cm of loose sand and gravel was removed from surface prior to excavation. At 10cm below surface--wet brown sand with interspersed patches of darker matrix.

Level: 2

Depth: 10-20cm

Soil in N end of 1x2 progressively becoming dark brown/black. Southern end remains light brown with patches of darker matrix.

Level: 3

Depth: 20-30cm

At 30 cm entire unit floor is black matrix. In North unit (16-17S) three hollow Krotovenas are present descending at least 10 cm.

Level: 4

Depth: 30-40cm

Same black sticky matrix, Krotovenas.

Level: 5

Depth: 40-50cm

South unit only-taken to 50 cm. At 50 cm, several Krotovenas filled with light brown/tan sand.

**LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM**

Project No.: L/T 1-87 Dates: Aug. 6-7, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 17-19S/96-97W

Final Depth: 20 cm Excavators: K. Dueholm

(B.S. , B.D. X)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:

Faunal Remains: Present: Absent:

Chipped Stone: No. of debitage: , No. of tools:

Bone Tools: Number: Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Elevations taken from NW corner. Loose sand surface to 5 cm, then coarse gravel at 18S, surface is 10cm below line level. No cultural materials observed.

Level: 2

Depth: 10-20cm

Coarse gravel in East half (17-18S), W half (18-19S) is loose sandy surface, to 15 cm (below line level), then gravel and rocks just like the East half. No cultural materials observed.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 9-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 24-25S/28-30W
Final Depth: 50 cm Excavators: K. Dueholm, S. Lund,
(B.S. , B.D. X)
Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 0
Depth: +10-0

Beach sand and beginning of brown silty loam, elevations taken from NW corner which is about 10 cm lower than rest of unit (this is why we started with Level 0.

Level: 1
Depth: 0-10cm

Brown silty loam. No cultural material.

Level: 2
Depth: 10-20cm

Brown silty loam. No cultural material.

Level: 3
Depth: 20-30cm

Mixed brown and orange sandy loam with much rodent (Krotovina) stuff. No cultural material.

Level: 4
Depth: 30-40cm

Fine brown-orange sand. Only W 1 x 1 dug to 40 cm. but sand appears to be continuous across whole 1 x 2. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 10-20, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 25-26S/31-33W
Final Depth: 60 cm Excavators: K. Dueholm, M. Cartwright, P. Sanders
(B.S. , B.D. X)
Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0
Faunal Remains: Present: 0 Absent:
Chipped Stone: No. of debitage: 10+ , No. of tools: 1
Bone Tools: Number: 0 Ground Stone Number: 0
Ceramics: No. of sherds: 0
Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1
Depth: 0-10cm

Light sand, dark compacted clay soil, not zone. Elevations taken from NW corner.

Level: 2
Depth: 10-20cm

Dark clay soil. Cultural material present.

Level: 3
Depth: 20-30cm

Dark clay soil. Cultural material found in screen.

Level: 4
Depth: 30-40cm

Dark clay soil. Cultural material in-situ and in screen. Biface found at 33cmBD, 70cm east of NW corner along north wall. Dark gray silty sand with pebbles and gravels, some bone, flakes present, mostly in W half.

Level: 5
Depth: 40-50cm

Same sediment, although started hitting gray silt-sand-clay, especially in E half.

Level: 6
Depth: 50-60cm

Mostly gray silt-sand-clay. No Cultural Material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 23-24, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 25-26S/33-35W

Final Depth: 50 cm Excavators: K. Dueholm

(B.S. , B.D. X)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0

Faunal Remains: Present: X Absent:

Chipped Stone: No. of debitage: 5+ , No. of tools: 0

Bone Tools: Number: 0 Ground Stone Number: 0

Ceramics: No. of sherds: 0

Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Very dark gray clay. This extends ca. 60 cm S in east half and to 80cm S in west, rest is below level. One flake from NW 1/4 of West half. Note, datum for this unit is NE corner. (This is an extension of a 1 x 2 to the E).

Level: 2

Depth: 10-20cm

Soil the same, across whole unit. No cultural material.

Level: 3

Depth: 20-30cm

Soil the same. No cultural material. Water smartweed rhizomes present in this and the previous two levels.

Level: 4

Depth: 30-40cm

Soil the same. Some flakes and bone fragment, mostly in East half.

Level: 5

Depth: 40-50cm

Soil the same, to ca. 43 cm, then more brownish sand in East two-thirds, rock and dark gravel, pebbles in West one-third, a few flakes in East two-thirds. Grayish clay and iron oxidation at bottom of level in East two-thirds.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 8-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 27-29S/55-56W
Final Depth: 70 cm Excavators: K.H. Dueholm
(B.S. , B.D. X)
Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: 0 Number: 0
Faunal Remains: Present: X Absent:
Chipped Stone: No. of debitage: 4, No. of tools: 0
Bone Tools: Number: 0 Ground Stone Number: 0
Ceramics: Number of sherds: 0
Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1
Depth: 0-10cm

Unit extends to 28.3-28.4W, then cutbank. No surface cover of vegetation. Soil is dark brown, slightly sandy loam. Beach sand was removed from surface. No cultural material.

Level: 2
Depth: 10-20cm

Soil is the same. Four TRSS flakes in North half. (27-28S).

Level: 3
Depth: 20-30cm

Soil the same except: gravel and rocks, 27.0-27.3 or 4S. Turning yellowish at bottom of level, and beach sand (surface) 28.6-29.0S. No cultural material observed.

Level: 4
Depth: 30-40cm

Soil is dark brown silt yet, in South half from 27.0-27.9 cm S is orangish gravel and rocks. No cultural material observed.

Level: 5
Depth: 40-50cm

Only South half dug (28-29S) (gravel at 28S). Soil is still silt. Rocks prevalent from 28.0-28.2S. No cultural material observed.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 8-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 27-29S/55-56W (Continued)

Final Depth: 70 cm Excavators: K.H. Dueholm

(B.S. , B.D. X)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: 0

Number: 0

Faunal Remains: Present: X

Absent:

Chipped Stone: No. of debitage: 4,

No. of tools: 0

Bone Tools: Number: 0

Ground Stone Number: 0

Ceramics: Number of sherds: 0

Description of Excavation Levels:

Depths: B.S. , B.D. X

Level: 6

Depth: 50-60cm

Same as above, but now gravel to 28.4S. No cultural material observed.

Level: 7

Depth: 60-70cm

Silt to 68cm, then gravel, except 28.9-29.0, is loose sand. Only this last 10cm S was taken down to 70cm, otherwise excavation was stopped at contact with gravel and rocks. No cultural material observed.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 8-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 24-26S/69-70W

Final Depth: 80 cm Excavators: T.K. Larson

(B.S. , B.D. X)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: 0 Number: 0

Faunal Remains: Present: X Absent:

Chipped Stone: No. of debitage: 0, No. of tools: 0

Bone Tools: Number: 0 Ground Stone Number: 0

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. , B.D. X

Level: 1

Depth: 0-10cm

Very dark brown sandy silt (almost black). NW corner used for elevations.

Level: 2

Depth: 10-20cm

Same as above, but grading into a lighter, sandier type of deposit.

Level: 3

Depth: 20-30cm

Brown silty sand.

Level: 4

Depth: 30-40cm

Brown silty sand.

Level: 5

Depth: 40-50cm

Brown silty sand.

Level: 6

Depth: 50-60cm

Brown silty sand.

Level: 7

Depth: 60-70cm

Brown silty sand.

Level: 8

Depth: 70-80cm

Brown silty sand changing to "Unit C" grayish sandy clay at bottom of level; also hit water table at 80cm.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 8-10, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 24-26S/69-70W (Continued)

Final Depth: 80 cm Excavators: T.K. Larson

(B.S. , B.D. X)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: 0 Number: 0

Faunal Remains: Present: X Absent:

Chipped Stone: No. of debitage: 0, No. of tools: 0

Bone Tools: Number: 0 Ground Stone Number: 0

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. , B.D. X

Remarks: Levels skim shoveled and water screen through 1/16" mesh. Most of the unit is in the zone originally described as "Unit A". This terminates at the bottom of the unit at a "Unit C" contact with water line. Unit A clearly has two subunits--this upper is darker and with less sand than the lower part. See profile drawings and photographs. A thin scattering of bone found between 30-52cm. These are small sized pieces (less than 2" diameter) of what appears to be large mammal long bone fragments. There is a thin layer of pebbles just below this bone at ca. 50 cm.

Photographs: Yes, in progress after form completed. See photo log.

Samples: Various one liter samples for gastropod, pollen, etc. See profile of units, West Wall.

Any Additional Forms, Maps, etc.: Profile drawing of West Wall.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: Shovel Test 345N line/360W
Final Depth: cm Excavators: K.H. Dueholm
(B.S. X, B.D.)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0
Faunal Remains: Present: X Absent:
Chipped Stone: No. of debitage: 1, No. of tools: 0
Bone Tools: Number: 0 Ground Stone Number: 0
Ceramics: Number of sherds: 0
Description of Excavation Levels: Depths: B.S. X , B.D.

Depth: 0 - 85cm

Brown silt, not as compact as previous holes (to West), to 80cm, then rocks and gravel; ca. 40-60cm BS has carbonates, and 60-80cm has much more sand (--sand loam). 1 piece of bone in 0-20cm (probably near bottom), and bone in NE wall at ca. 20-23cm (very fragile). 1 flake at 60-80cm.

No old stake located.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: Shovel Tests 345N line/370W

Final Depth: cm Excavators: K.H. Dueholm

(B.S. X, B.D.)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number:

Faunal Remains: Present: Absent:

Chipped Stone: No. of debitage: 2, No. of tools:

Bone Tools: Number: Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. X , B.D.

Depth: 0-75cm

Compact brown silt to 74cm, then 1 cm gravel, some rocks. Broken glass and ceramics to 30cm. 1 Knife River Flint flake 3ry, size 2(3) (and 3 pieces broken glass or ceramics) 15-30cm and 1 primary, size 2, at 50-75cm, possibly from scraping higher level walls. One possible fire-cracked rock just below sod (ca. 5-10cm). No old stake located.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 345N/420W Shovel Test
Final Depth: 70 cm Excavators: S. Lund
(B.S. X, B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10 cm
Red stake, roots and gray topsoil.

Level: 2
Depth: 0-20cm
Second stake end, hard packed gray silt. No cultural material.

Level: 3
Depth: 20-30cm
Hard packed gray silt.

Level: 4
Depth: 30-40cm
Hard packed gray silt. No cultural material.

Level: 5
Depth: 40-50cm
Hard packed gray silt and top of large rocks.

Level: 6
Depth: 50-60cm
Large and smaller rocks. No cultural material

Level: 7
Depth: 60-70cm
Small pebbles and orange sand. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 345N/430W (Continued)

Final Depth: 100 cm Excavators: S. Lund

(B.S. X , B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:

Faunal Remains: Present: Absent:

Chipped Stone: No. of debitage: No. of tools:

Bone Tools: Number: Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 9

Depth: 80-90cm

Light gray silt.

Level: 10

Depth: 90-100cm

Gray silt on top, gravel at 100cm.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 345N/440W Shovel Test

Final Depth: 36 cm Excavators: S. Lund

(B.S. X, B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight:

Number:

Faunal Remains: Present:

Absent:

Chipped Stone: No. of debitage: ,

No. of tools:

Bone Tools: Number:

Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1

Depth: 0-10cm

Two red stakes, light brown earth on top, then hard packed gray silt.

Level: 2

Depth: 10-20cm

Hard packed gray silt. No cultural material.

Level 3:

Depth: 20-30cm

Hard packed gray silt. No cultural material.

Level: 4

Depth: 30-36cm

36cm orange gravel. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 345N/450W Shovel Test
Final Depth: 20 cm Excavators: S. Lund
(B.S. X , B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10cm

Light brown silt. Gravels at 5cm BS. Red stake located in unit.

Level: 2
Depth: 10-20cm

Orange gravel. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 345N/460W Shovel Test

Final Depth: 20 cm Excavators: S. Lund

(B.S. X , B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight:

Number:

Faunal Remains: Present:

Absent:

Chipped Stone: No. of debitage: ,

No. of tools:

Bone Tools: Number:

Ground Stone Number:

Ceramics: No. of sherds:

Description of Excavation Levels:

Depths: B.S. X , B.D.

Level: 1

Depth: 0-10cm

Brown sand and gravels.

Level: 2

Depth: 10-20cm

Gravel. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 355N / 370W Shovel Test

Final Depth: 60 cm Excavators: S. Lund

(B.S. X , B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10cm

Roots, gray silt and gravel at 10cm level.

Level: 2
Depth: 10-20cm

Rocks, some gravel and gray silt. No cultural material.

Level: 3
Depth: 20-30cm

Gray silt and some rocks. No cultural material.

Level: 4
Depth: 30-40cm

Gray silt and some large rocks. No cultural material.

Level: 5
Depth: 40-50cm

Gray silt, some large and small rocks. No cultural material.

Level: 6
Depth: 50-60cm

Gray and yellow silt, some rocks. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 355N/390W Shovel Test
Final Depth: 80 cm Excavators: S. Lund
(B.S. X , B.D.)
Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10cm
Root zone.

Level: 2
Depth: 10-20cm
Gray silt, some rocks. No cultural material.

Level: 3
Depth: 20-30cm
Gray silt. No cultural material.

Level: 4
Depth: 30-40cm
Gray silt. No cultural material.

Level: 5
Depth: 40-50cm
Gray silt. No cultural material.

Level: 6
Depth: 50-60cm
Gray silt. No cultural material.

Level: 7
Depth: 60-70cm
Gray silt. No cultural material.

Level: 8
Depth: 70-80cm
Gray silt and gravel at 80cm. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 355N/ 380W Shovel Test
Final Depth: 90 cm Excavators: S. Lund
(B.S. X , B.D.)
Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0
Faunal Remains: Present: Absent: X
Chipped Stone: No. of debitage: 1, No. of tools: 0
Bone Tools: Number: 0 Ground Stone Number: 0
Ceramics: No. of sherds: 0
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10cm

Roots and gray silt, some rocks. No cultural material.

Level: 2
Depth: 10-20cm

Gray silt 20cm. No cultural material.

Level: 3
Depth: 20-30cm

Dirt and gravel. No cultural material.

Level: 4
Depth: 30-40cm

Gray silt and some rocks at top of level. One flake.

Level: 5
Depth: 40-50cm

Gray silt and some rocks. No cultural material.

Level: 6
Depth: 50-60cm

Gray silt and some rocks. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 355N /380W (Continued)

Final Depth: 90 cm Excavators: S. Lund

(B.S. X , B.D.)

Cultural Materials: Present: X Absent:

If Present:

Fire-cracked rock: Weight: Number: 0

Faunal Remains: Present: Absent: X

Chipped Stone: No. of debitage: 1, No. of tools: 0

Bone Tools: Number: 0 Ground Stone Number: 0

Ceramics: No. of sherds: 0

Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 7

Depth: 60-70cm

Gray silt and some rocks. No cultural material.

Level: 8

Depth: 70-80cm

Gray silt and some rocks. No cultural material.

Level: 9

Depth: 80-90cm

Gray silt.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 355N/ 450W Shovel Test
Final Depth: 10 cm Excavators: S. Lund
(B.S. X , B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10 cm

Root zone, then gravel. No cultural material.

LARSON-TIBESAR ASSOCIATES
EXCAVATION RECORD FORM

Project No.: L/T 1-87 Dates: Aug. 19-21, 1987 Site No.: 39WW15

Site Name: Travis 2 Excavation Unit: 355N/440W Shovel Test
Final Depth: 15 cm Excavators: S. Lund
(B.S. X , B.D.)

Cultural Materials: Present: Absent: X

If Present:

Fire-cracked rock: Weight: Number:
Faunal Remains: Present: Absent:
Chipped Stone: No. of debitage: , No. of tools:
Bone Tools: Number: Ground Stone Number:
Ceramics: No. of sherds:
Description of Excavation Levels: Depths: B.S. X , B.D.

Level: 1
Depth: 0-10cm

Root zone and gravel.

Level: 2
Depth: 10-15cm

Gravel and large rocks. No cultural material.

APPENDIX B
PHOTOGRAPHIC LOGS

PHOTO LOG

Project Number: L/T 1-87

Roll Number: 1

Site No.: 39WW15

<u>FRAME</u>	<u>DESCRIPTION</u>	<u>DIRECTION</u>	<u>DATE</u>
1	50-51W/00-01N West Wall	W	22 Aug. 87
2	60-61W/00-01N West Wall	W	22 Aug. 87
3	60-61W/20-21N West Wall	W	22 Aug. 87
4	90-91W/6-7S West Wall	W	22 Aug. 87
5	96-97W/17-19S West Wall	W	22 Aug. 87
6	69-70W/24-26S West Wall	W	22 Aug. 87
7	Backhoe Trench 1, East Wall 0-1m N	ESE	22 Aug. 87
8	Backhoe Trench 1, East Wall 1-2m N	ESE	22 Aug. 87
9	Backhoe Trench 1, East Wall 2-3m N	ESE	22 Aug. 87
10	Backhoe Trench 1, East Wall 3-4m N	ESE	22 Aug. 87
11	Backhoe Trench 1, East Wall 4-5m N	ESE	22 Aug. 87
12	Backhoe Trench 1, East Wall 5-6m N	ESE	22 Aug. 87
13	Backhoe Trench 1, East Wall 6-7m N	ESE	22 Aug. 87
14	Backhoe Trench 1, East Wall 7-8m N	ESE	22 Aug. 87
15	Backhoe Trench 1, East Wall 8-9m N	ESE	22 Aug. 87
16	Backhoe Trench 1, East Wall 9-10m N	ESE	22 Aug. 87
17	Backhoe Trench 1, East Wall 10-11m N	ESE	22 Aug. 87
18	Backhoe Trench 1, East Wall 11-12m N	ESE	22 Aug. 87
19	Backhoe Trench 1, East Wall 12-13m N	ESE	22 Aug. 87
20	Backhoe Trench 1, East Wall 13-14m N	ESE	22 Aug. 87
21	Backhoe Trench 1, East Wall 14-15m N	ESE	22 Aug. 87
22	Backhoe Trench 1, East Wall 15-16m N	ESE	22 Aug. 87
23	Backhoe Trench 1, East Wall 16-17m N	ESE	22 Aug. 87
24	Backhoe Trench 1, East Wall 17-18m N	ESE	22 Aug. 87
25	Backhoe Trench 1, East Wall 18-19m N	ESE	22 Aug. 87

PHOTO LOG

Project Number: L/T 1-87

Roll Number: 2

Site No.: 39WW15

<u>FRAME</u>	<u>DESCRIPTION</u>	<u>DIRECTION</u>	<u>DATE</u>
00	Backhoe Trench 1, East Wall 19-19.9 m N	ESE	22 Aug. 87
0	B.H.T. 1, Oblique view of East Wall (ca. 0-10)	ESE	22 Aug. 87
1	B.H.T. 1, Oblique view of East Wall (ca. 8-14)	ESE	22 Aug. 87
2	Backhoe Trench 2, View of Trench	N	22 Aug. 87
3	Backhoe Trench 2, East Wall 0-1m N	E	22 Aug. 87
4	Backhoe Trench 2, East Wall 1-2m N	E	22 Aug. 87
5	Backhoe Trench 2, East Wall 2-3m N	E	22 Aug. 87
6	Backhoe Trench 2, East Wall 3-4m N	E	22 Aug. 87
7	Backhoe Trench 2, East Wall 4-5m N	E	22 Aug. 87
8	Backhoe Trench 2, East Wall 5-6m N	E	22 Aug. 87
9	Backhoe Trench 2, East Wall 6-7m N	E	22 Aug. 87
10	Backhoe Trench 2, East Wall 7-8.4m N	E	22 Aug. 87
11	50-51W/ 0-1N North Wall	N	22 Aug. 87
12	50-51W/ 0-1N East Wall	E	22 Aug. 87
13	60-61W/ 0-1N North Wall	N	22 Aug. 87
14	60-61W/20-21N North Wall	N	22 Aug. 87
15	90-91W/6-7S North Wall	N	22 Aug. 87
16	90-91W/6-7S East Wall	E	22 Aug. 87
17	90-91W/6-7S South Wall	S	22 Aug. 87
18	79-80W/16-18S North Wall	N	22 Aug. 87
19	69-70W/24-26S North Wall	N	22 Aug. 87
20-24	Field Crew at Work		22 Aug. 87

PHOTO LOG

Project Number: L/T 1-87

Roll Number: 3

Site No.: 39WW15

<u>FRAME</u>	<u>DESCRIPTION</u>	<u>DIRECTION</u>	<u>DATE</u>
0	31-33W/25S North Wall (50cm scale)	N	22 Aug. 87
1	33-35W/25S North Wall	N	22 Aug. 87
2	35W/25-26S West Wall	W	22 Aug. 87
3	31W/25-26S West Wall	E	22 Aug. 87
4	28-30W/24-25S North Wall	N	22 Aug. 87
5	28-30W/24-26S West Wall	W	22 Aug. 87
6	Documentation of Field Crew performing their various duties	NA	22 Aug. 87

APPENDIX C

**STATE OF SOUTH DAKOTA
FIELD CATALOG SHEETS**

ECA-CP-255

Field Catalog Sheet

State of South Dakota
Archaeological Research Center

County Walworth
Site No. 39WM15
Accession No. _____

Catalog No.	Description	Unit	Location	Depth	Date	Comments
39WM15-1	Three Flakes		E.U. 7-8S/27-28W	10-20cm	8/87	
39WM15-2	Knife River Flint Primary Flake		E.U. 6-7S/27-28W	40-50cm	8/87	
39WM15-3	Large Mammal Long Bone Fragment		E.U. 6-7S/27-28W	40-50cm	8/87	
39WM15-4	Knife River Flint Tertiary Flake		E.U. 16-17S/79-80W	20-30cm	8/87	
39WM15-5	Two Rodent Incisors		E.U. 17-18S/79-80W	10-20cm	8/87	
39WM15-6	Large Mammal Tooth Enamel		E.U. 17-18S/79-80W	0-10cm	8/87	
39WM15-7	Three Flakes		E.U. 25-26S/32-33W	0-10cm	8/87	
39WM15-8	Knife River Flint Secondary Flake		E.U. 25-26S/32-33W	10-20cm	8/87	
39WM15-9	Knife River Flint Core		E.U. 25-26S/32-33W	20-30cm	8/87	
39WM15-10	Two Knife River Flint Secondary Flakes		E.U. 25-26S/32-33W	20-30cm	8/87	

Cataloged by P.H. Sanders Date 2-19-88

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Field Catalog Sheet

State of South Dakota
Archaeological Research Center

County Halworth
Site No. 39HW15
Accession No. _____

Catalog No.	Description	Unit	Location	Depth	Date	Comments
39HW15-11	Chert Biface Fragment		E.U. 25-26S/ 32-33W	30-40cm	8/87	
39HW15-12	Nine Flakes		E.U. 25-26S/ 32-33W	30-40cm	8/87	
39HW15-13	Knife River Flint Primary Flake		E.U. 25-26S/ 32-33W	0-20cm	8/87	
39HW15-14	White Chert Secondary Flake		E.U. 25-26S/ 32-33W	0-10cm	8/87	
39HW15-15	Two Bone Fragments		E.U. 25-26S/ 32-33W	30-40cm	8/87	
39HW15-16	Two Flakes		E.U. 25-26S/ 31-32W	30-40cm	8/87	
39HW15-17	Two Flakes		E.U. 25-26S/ 33-34W	30-40cm	8/87	
39HW15-18	Two Flakes		E.U. 25-26S/ 33-34W	40-50cm	8/87	
39HW15-19	Two Flakes		E.U. 25-26S/ 34-35W	30-40cm	8/87	
39HW15-20	One Bone Fragment		E.U. 25-26S/ 34-35W	30-40cm	8/87	

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Field Catalog Sheet

State of South Dakota
Archaeological Research Center

County Malworth
Site No. 39WM15
Accession No. _____

Catalog No.	Description	Unit	Location	Depth	Date	Comments
39WM15-21	One Tongue River Silicified Sediment Flake (Shatter)		E.U. 6-7S 90-91W	20-30cm	8/87	
39WM15-22	One Brown Chalcedony Fragment (Shatter?)		E.U. 6-7S/ 90-91W	63cm	8/87	
39WM15-23	Four Tongue River Silicified Sediment Flakes		E.U. 27-28S/ 55-56W	10-20cm	8/87	
39WM15-24	One Mollusk Shell		E.U. 24-25S/ 69-70W	20-30cm	8/87	
39WM15-25	Two Unidentifiable Bone Fragments		E.U. 24-25S/ 69-70W	40-50cm	8/87	
39WM15-26	One Burnt Unidentifiable Bone Fragment		E.U. 24-25S/ 69-70W	60-70cm	8/87	
39WM15-27	Three Unidentifiable Bone Fragments		E.U. 24-25S/ 69-70W	70-80cm	8/87	
39WM15-28	Two Mollusk Shells		E.U. 24-25S/ 69-70W	70-80cm	8/87	
39WM15-29	Three Unidentifiable Bone Fragments		E.U. 25-26S/ 69-70W	30-40cm	8/87	
39WM15-30	Two Unidentifiable Bone Fragments		E.U. 25-26S/ 69-70W	40-50cm	8/87	

Cataloged by P.H. Sanders Date 2-19-88

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Field Catalog Sheet

State of South Dakota
Archaeological Research Center

County Malworth
Site No. 39WM15
Accession No. _____

Catalog No.	Description	Unit	Location	Depth	Date	Comments
39WM15-31	Five Mollusk Shells		E.U. 25-26S/ 69-70W	60-70cm	8/87	
39WM15-32	One Unidentifiable Bone Fragment		E.U. 25-26S/ 69-70W	60-70cm	8/87	
39WM15-33	White Chalcedony Late Prehistoric Corner- Notched Projectile Point	M.P. 1	Surface Collection	0	8/87	
39WM15-34	Knife River Flint Late Paleoindian Lanceolate Projectile Point	M.P. 2	Surface Collection	0	8/87	
39WM15-35	Four Unidentifiable Bone Fragments	M.P. 3	Surface Collection	0	8/87	
39WM15-36	Proximal Metapodial Fragments (Bison?)	M.P. 4	Surface Collection	0	8/87	
39WM15-37	Unidentifiable Bone Fragments		S.T. 345N/360W	20-40cm BS	8/87	UND Coordinates
39WM15-38	White Chalcedony Secondary Flake		S.T. 345N/360W	60-70cm BS	8/87	UND Coordinates
39WM15-39	Brown Chalcedony Secondary Flake		S.T. 345N/370W	15-30cm BS	8/87	UND Coordinates
39WM15-40	Gray Chert Secondary Flake (Burnt)		S.T. 345N/370W	50-75cm BS	8/87	UND Coordinates

